

SHORT WAVE

VOL. XXXVIII

MARCH 1980

NUMBER 1



TRIO R1000

£298 inc VAT Carr £4.50

The R-1000 uses an advanced PLL system in an up-conversion scheme to a high (48MHz) first IF to remove any possibility of image responses. The receiver covers the entire frequency range from below 200kHz right up to 30MHz in 30 bands, each 1MHz wide. The bands are selected, not by ambiguous knob twiddling as in receivers using the Wadley loop but by a 30 position band switch which controls the PLL system.

The band switch also electronically selects the appropriate band pass filter network in the RF stages of the receiver so there are no "preselector" or "antenna trim" controls to twiddle — simply set the band switch to the range required — that's it!

A highly stable VFO tunes each 1MHz range and its linear, back lit scale makes readout easy. However, in addition to this dial, Trio have also provided 5 digit true frequency digital readout so as to guarantee spot on accuracy on any frequency. As a further feature, the digital display can also be switched to read time, this being derived from a quartz standard. Marvellous for accurate log keeping. The display uses high intensity readout units which can be dimmed for use in low light conditions.

As for what else is inside this superb instrument — selectivity is catered for by three custom made IF filters; a 12kHz wide AM filter; 6kHz narrow AM filter; and a new 2.7kHz SSB filter with a shape factor of better than 1:2 6:60dB. Selectable sidebands are available at the touch of a switch.

For the first time in mid-price receiver, a true noise blanker is provided to remove pulse type ignition noise.

To minimise front end overload, a step RF attenuator is included which gives 0-60dB attenuation in four steps.

All the rear panel connectors are recessed on a sloping panel so that you can stand the receiver either on its back, or pushed hard against a wall when used in conventional shelf mounting. The antenna inputs allow the use of either a high impedance wire aerial or a 50ohm balanced input so that the proverbial long lump of wire will work really well with the R-1000.

This receiver is so advanced it makes everything in its price range completely obsolete.

LOWE ELECTRONICS LTD. CHESTERFIELD ROAD, MATLOCK, DERBYSHIRE.

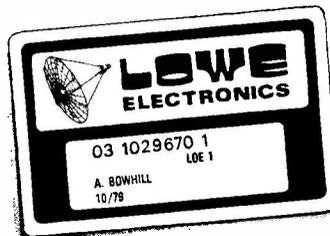
LOWE ELECTRONICS Ltd

PRICE LIST MARCH 1980

	Price inc. VAT	Carriage		Price inc. VAT	Carriage
TRIO EQUIPMENT					
TS820—160-10m transceiver 200W PEP	£669.30	£4.50			
DG1—Digital readout to 100Hz	£121.90	£1.50			
SP820—Speaker	£37.95	£1.50			
VFO820—External VFO	£118.45	£4.50			
YG88C—CW filter 8pole	£36.80	£0.50			
R820—The ultimate matching receiver to the TS820	£690.00	£4.50			
YG455C—CW filter 500Hz	£58.65	£0.50			
YG455CN—CW filter 250Hz	£60.95	£0.50			
YG88A—AM filter 6KHz	£34.50	£0.50			
TS520SE—160-10m transceiver	£437.00	£4.50			
VFO520S—External VFO	£98.90	£4.50			
SP520—Speaker	£17.25	£1.50			
YG3395C—8pole CW filter	£37.95	£0.50			
DG5—Digital display/counter	£103.50	£1.50			
DK520—Conversion for older TS520	£10.35	£0.75			
TS120S—80-10m mobile transceiver 200W PEP	£432.00	£4.50			
TS120V—80-10m mobile transceiver 20W PEP	£347.30	£4.50			
PS20—AC power supply for TS120V	£44.85	£4.50			
MB100—Mobile mounting bracket	£17.25	£1.00			
YK88C—500Hz CW filter	£28.75	£0.50			
SP120—External speaker	£25.30	£1.25			
VFO120—External VFO	£89.70	£4.50			
AT120—Antenna tuner (100W)	£55.20	£1.50			
PS30—AC PSU for TS120S	£85.10	£4.50			
AT200—1.8-30MHz antenna tuner	£82.80	£1.50			
SM220—Monitor scope	£197.80	£4.50			
BS5—TS520 scanboard for SM220	£48.30	£0.50			
BS8—TS820 scanboard for SM220	£48.30	£0.50			
TL120—80-10m 200W linear	£128.80	£4.50			
TL922—HF linear amplifier 160-10m/2Kw PEP 2 x 3-500Z tubes	£672.75	£4.50			
MC50—De luxe desk microphone dual impedance PTT locking bar	£24.15	£1.50			
MC355—50K fist microphone	£13.80	£1.00			
MC30S—500ohm fist microphone	£13.80	£1.00			
LF30A—HF low pass filter 1Kw 90dB, stop band rejection	£18.40	£1.00			
BPF2A—2m band pass filter 144-146MHz 50W rms 100W PEP	£21.85	£1.25			
RD300—High power dummy load	£48.30	£1.50			
TS770—2m/70cm all mode dual bander	£690.00	£4.50			
SP70—Matching speaker	£18.40	£1.00			
TR7600—2m Synthesised mobile/fixed transceiver	£220.00	£4.50			
RM76—Microprocessor control unit	£60.95	£1.50			
TR2300—2m FM portable transceiver PLL with all 80FM channels	£166.75	£4.50			
VB2300—10W booster	£49.45	£1.50			
MB2—Mobile mount	£17.25	£1.00			
RA1—Helical rubber antenna	£6.90	£0.50			
PS1200—Power unit and charger TR2300/3200/2200GX	£29.50	£1.50			
TR2400—2 meter synthesised handheld transceiver	£210.45	£4.50			
ST1—Base Stand and quick charger	£43.70	£1.50			
BC5—12V quick charger	£17.25	£1.50			
SC3—Carrying case	£11.50	£0.50			
TS180S—160-10m solid state transceiver	£589.95	£4.50			
TS180S—as above but with digital frequency control	£679.65	£4.50			
VFO180—External VFO	£96.60	£1.50			
SP180—Speaker	£36.80	£1.50			
DF180—Digital frequency control	£104.65	£1.00			
AT180—1.8-30MHz antenna tuner	£95.45	£4.50			
PS30—AC power unit for TS180S	£85.10	£4.50			
TR8300—70cm FM mobile transceiver fitted 4 channels	£225.00	£4.50			
TR3200—70cm FM handy transceiver fitted with 3 channels	£164.45	£4.50			
MB1A—Matching mobile mount	£9.20	£1.00			
P810—Pack of 10 Ni-cad batteries	£10.35	£0.50			
TR3200/2300—Spare power lead	£1.30	£0.15			
R1000—0.2-30MHz receiver	£297.85	£4.50			
SP100—External speaker	£26.45	£1.50			
R300—General coverage receiver	£149.50	£4.50			
HS5—Communications headphones, tailored response	£21.85	£0.75			
HS4—Communications headphones, tailored response	£10.35	£0.75			
TRIO OSCILLOSCOPES					
CS1830—Dual trace 30MHz B/W with delayed sweep	£523.00	£4.50			
CS1577—Dual trace 30MHz with Signal delay	£471.50	£4.50			
CS1572—New dual trace 30MHz scope designed for VTR servicing	£488.75	£4.50			
CS1566—Dual trace 20MHz	£339.25	£4.50			
CS1560A—Dual trace 15MHz 10mV/cm on X and Y	£316.25	£4.50			
CS1562A—Dual trace 10MHz Auto run and trigger TB	£261.05	£4.50			
CS1352—Dual trace 15MHz portable. Mains or 12v operation	£362.25	£4.50			
The above 7 scopes are complete with matching probes					
CS1575—Dual trace 4 channel audio scope. 1mV sensitivity	£270.25	£4.50			
CO1303D—Single trace 5MHz service/student oscilloscope	£109.25	£4.50			
DM800—Multi purpose dip resonance meter. 700KHz-250Mhz	£51.75	£1.00			
AG203—Sine/square generator. 10Hz-1MHz	£120.75	£4.50			
AG202—Sine/square generator. 20Hz-200KHz	£65.55	£4.50			
SG402—Matching service shop RF generator. 100KHz-30MHz	£52.90	£4.50			
DL705—Digital Multimeter	£80.50	£4.50			
FC756—10Hz-500MHz frequency counter	£258.75	£4.50			
LOWE ELECTRONICS LTD.					
Lowe SRX30—Synthesised general coverage receiver	£178.00	£4.50			
NIHON DENGYO					
Liner 430—70cm SSB transceiver	£150.00	£4.50			
Belcom 707—70cm fixed/mobile transceiver. All mode	£495.00	£4.50			
Belcom HC1400—25W 2m FM transceiver with memories	£199.00	£4.50			
Belcom LD201—Remote display for HC1400	£26.50	£0.50			
2M PORTABLE TRANSCEIVERS					
Mizuho SB-2M 2 metre SSB/CW portable transceiver	£135.00	£4.50			
AR240A—2 metre FM handheld transceiver New model	£168.00	£4.50			
AR240—Carrying case	£4.10	£0.40			
AR240—Helical antenna	£4.10	£0.40			
AR240—12V car battery charger	£4.10	£0.40			
VHF Marine Receivers					
SR9—Tunable/Crystal monitor 156-162Mhz	£46.00	£1.50			
FS10—10 channel pocket scanning receiver	£82.00	£1.50			
FS10—Fitted 10 channels	£109.25	£1.50			
AMR217B—Scanner with 8 crystals. The best. Mains/Battery	£120.75	£1.50			
M100—Digital Scanner 30-50, 144-174, 440-512MHz FM	£192.00	£4.50			
VHF Amateur Receivers					
SR9—Tunable/crystal 2m FM receiver 144-146MHz	£46.00	£1.50			
AMR217B—Scanner with 8 crystals. The best. Mains/battery	£120.75	£1.50			
Crystals for above. Each	£2.50	£0.25			
FS10—10 channel pocket scanning receiver	£82.00	£1.50			
Crystals for FS10 amateur as above	£2.50	£0.25			
Airband Receivers					
Regency—Digital Flight Scan. Full band coverage. No crystals required	£230.00	£4.50			
Lowe AP12—With batteries and charger	£89.70	£1.50			
AP12—Fitted 12 crystals	£118.45	£1.50			
AP12—Leatherette case	£2.28	£0.40			
Signal R512—Air band scanner fitted 5 channels	£138.00	£1.50			
R517—Air band portable, 118-144MHz tunable/xtal.	£49.45	£1.00			
Crystals for above. Each	£2.80	£0.25			
R517—Soft case	£2.75	£0.50			
Keys					
TRX3—Practice oscillator	£5.85	£1.00			
Morse Key—Lightweight brass key	£2.80	£0.50			

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	Price inc. VAT	Carriage		Price inc. VAT	Carriage
Morse Keys—HK708	£9.66	£1.00	Screwdriver kit, 6 piece	£1.50	£0.75
Morse Key—Sykes-Robertson standard key	£11.50	£1.00	Punch kit—set of 5 chassis punches and reamer	£8.63	£0.75
Squeeze paddle Deluxe model	£25.00	£1.00	Pearl catch—for picking up small nuts, etc.	£0.98	£0.25
EK150—Katsumi keyer, 240V ac/12V dc operation, built-in monitor	£78.20	£1.50	Mic. clip—screw fixing	£0.21	£0.25
MK1024—Electronic keyer with 1024 bit memory	£134.00	£1.50	Mic. clip—self adhesive	£0.25	£0.25
HK704—Squeeze paddle	£10.50	£0.50	Mic. clip—magnetic	£0.31	£0.25
Rotators			Station log book	75p inc. p.&p	
AR40—(5 core cable required)	£54.63	£4.50	HF Mobile Antennas		
FU200—For light weight 2m beams	£40.39	£4.50	"G" whip tribander helical 20/15/10	£24.73	£1.25
DR7500—Will take 3 element tribander	£108.10	£4.50	"G" whip multimobile 20/15/10	£28.75	£1.25
DR7600—Will take 2 element 40 metre beam	£154.10	£4.50	L.F. coils for the above whips (specify whether tribander or multimobile)	£6.56	£0.75
DR7600P—As above but with preset or manual controller	£204.70	£4.50	Telescopic whips for the above	£3.34	£0.75
Mobile Whips etc.			Base mount for all "G" whips	£4.49	£0.75
Hokushin Range—			Extendarod 40" booster	£11.50	£1.25
2E—2m $\frac{1}{2}$, 3.4dB gain, foldover base	£6.50	£1.00	New "M" range of Station Accessories		
2NE—2m $\frac{1}{2}$, 4.5dB gain	£11.00	£1.00	MP1—Panel kit for APM-1	£5.20	£1.00
430E—70cm $\frac{1}{2}$ + $\frac{1}{2}$, 5.5dB gain	£10.00	£1.00	AX-1—Station antenna selector box	£27.03	£1.50
320—2m stainless $\frac{1}{2}$ wave on PL259	£1.50	£1.00	KX-2—Antenna coupler 500KHz-30MHz	£29.90	£1.50
HS-F1—2m rubber helical on PL259	£3.95	£0.30	APM-1—Audio peak and notch active filter	£33.00	£1.50
RG4M—Base for all above units inc. coax ready terminated in PL259	£3.00	£0.75	SR-1—Mini rack for "M" range	£14.09	£1.50
GSS—Heavy duty gutter/boot mount to take RG4M base	£3.15	£0.50	SWR Meters		
MB5—Mag mount with 5m coax terminated in PL259	£7.95	£1.00	Soar—SWR25 Twin meter	£12.78	£1.00
CBA311—2m gutter clamp aerial ★ Special Offer ★	£6.00	£0.50	SW-110—SWR/power meter 1.8-150MHz, 0.20 and 0-200W	£34.50	£1.25
MA41—2m $\frac{1}{4}$ wave gutter mount aerial complete with whip, clamp, cable etc.	£11.33	£1.00	FS-301—Through line watt meter 3.5-30MHz	£39.10	£1.25
Base station aeriels			CN620—Unique cross pointer meter, 1.8-150MHz	£52.81	£1.25
HF5—Our original success, 80-10m HF vertical, no radials required on ground post	£41.40	£4.50	CN630—140-450MHz	£71.00	£1.25
HF5R—Radial kit for mast mounting	£23.00	£4.50	CN650—1.2-2.5GHz	£95.00	£1.25
MA5—New TRIO 5 band mobile aerial, complete GPV5—High performance 2m base station coilnear	£22.00	£4.50	RW151D—50ohm load/wattmeter 0-150W, 0-500MHz	£69.00	£1.50
GDx2—3dB gain over the range 50-480MHz. The classic wideband aerial	£36.80	£4.50	RD300—1KW PEP 50ohm dummy load	£59.80	£1.50
LAB—Air band ground plane	£11.50	£1.50	DL20—20W 50ohm dummy load	£6.04	£0.50
Power Supplies. All 220-240V ac input			Antenna Accessories		
PS3A—300mA at 6, 7.5, 9V. Dual polarity o/p	£2.85	£1.00	CS201—Two way coax switch 0-500MHz	£11.98	£0.75
PS2—1A at 6, 9, 12V	£15.65	£1.25	CX3A—Three way coax switch 0-30MHz	£5.59	£0.75
PS1—400mA at 3, 4.5, 6, 9V	£5.65	£1.00	FBB9A—1:1 balun 50ohm 1KW PEP	£11.50	£0.75
PS125—3.5A at 13.8V regulated	£18.40	£1.25	Inline Lightning Arrester	£1.15	£0.25
PS1207—700mA at 13.8V regulated	£10.93	£1.00	CN1001—Automatic A.T.U.	£130.00	£1.50
★ NEW ★			Egg insulator—small	£0.30	£0.25
FX1—Station wavemeter 700KHz-250MHz	£28.00	£1.00	Egg insulator—large	£0.45	£0.36
BR85—L.C.R. bridge, marvellous instrument	£39.00	£1.25	Egg insulator—strain	£0.35	£0.36
DX450—Desk mic, built in digital clock and transmission timer. <i>The best</i>	£63.00	£1.00	Chimney lashing kit (single arm)	£3.45	£5.75
SB10—6V dc morse practice oscillator	£0.95	£0.25	Chimney lashing kit (double arm)	£5.75	Callers only
ME221—Station multimeter 20K/V	£16.49	£0.75	Heavy duty wall brackets (pair)	£6.33	
RA144—2 metre receiver preamp.	£9.05	£0.25			
FC-5M—5 digit 50MHz counter with i.f. offset	£41.40	£0.50			
FC22A—250MHz counter with i.f. offset	£66.70	£0.75			
DX-008—Fully programmable counter; gives digital readout on any rig.	£115.00	£1.25			
LCM-1—500MHz counter 240V/12V	£115.00	£1.25			



Everyone is talking about the new Lowe credit card scheme, following its introduction at Leicester. This is the new, easy way to have the rig you wanted right away and avoid any future price rises. How does it work? You simply agree to pay a fixed amount each month and you then get instant purchasing power of 24 times the payment. For example, a payment of £10 gives you £240 of credit, more than enough to buy that TR2300 aerial and accessories. No tuss and no hefty deposits needed. A further advantage is that as the payments continue, your credit is automatically extended to allow further purchases. Why not send for full details right away and join the growing numbers who hold the Lowe blue card—the way to have tomorrow's equipment today. A major advance to your purchasing power.

THE WAY TO HAVE TOMORROW'S EQUIPMENT TODAY

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FT107M NEW SOLID STATE TRANSCEIVER



FT107M

FT107M Transceiver £660.00
MEM/DMS Memory £87.00
FP107E AC PSU Extnl. £92.50
FP107 Int. AC PSU T.B.A.

FV107 Ext. VFO £80.00
PC107 Antenna Tuner £92.50
SP107 External Speaker £24.00
FTV107(12) Transverter £181.50

FTV107 Transverter frame £96.50
430-440 70cm module £158.50
144-148 2m module £88.50
50-54 6m module £88.50

YM34 Mic. desk T.B.A.
YM35 Mic. hand scan T.B.A.
YM36 Mic. noise cancel T.B.A.
YM37 Mic. Hand T.B.A.

All solid state transceiver, 160-10M (+ WWV Rx and 2 Aux). 12V DC, SSB, CW, FSK and AM. 240W pip. The fan cooled (thermostatically controlled) no tune "broad band" power amplifier delivers 75% power output into 3:1 VSWR. Analogue and digital readout to 100Hz. Sensitive and with excellent dynamic range (hard driven schottky diode ring mixer). Continuous variable bandwidth 300Hz to 2.4kHz plus optional "basics" of 350/600Hz and 6kHz. Full equipment includes: audio peak/notch filter, full metering including SWR, RF speech processor, advanced noise blanker, semi break-in with side tone, VOX, clarifier on Tx, Rx, or both, 20dB attenuator etc. The optional memory system provides 12 stored channels (with fine tuning), and offers scanning from the microphone. The store employs DMS - digital memory shift - to allow tuning, via a photo interrupter of any of the memorised frequencies (equivalent to 13 VFOs!).

FT901DM THE SUPERB PERFORMER



FT901

FT901DM Transceiver £800.00
FT901D Transceiver £710.00
FT901DF Transceiver £700.00
YR901 Morse/TTY read £395.00

YVM 1 Video Monitor £125.00
YD901 Monitor scope £240.00
YD901P YD901 with pan £280.00
PAN KIT Mod kit £47.00

FTV901 Transverter £245.00
430-440 70cm module £160.00
50-54 6m module £60.00
70-74 4m module £75.00

FC901 Antenna Tuner £115.00
FL2100Z Linear Amp. £355.00
FV901DM Synth. Ext VFO £215.00
SP901 External Speaker £24.00

160-10M (+ WWV Rx), 12 and 234V (PSU Built-in). SSB, AM, CW, FSK and FM (Tx & Rx), 180W. PIP, 80W FI. Analogue 1kHz and digital to 100Hz. Sensitive μ V with AGC controlled Mosfet RF, to push pull FET RF. Balance active mixer, push pull IF amp, to crystal filter then noise blanker. Continuously variable selectivity 300Hz to 2.4kHz, and fixed 600Hz, 2.4kHz and 12kHz (at 6dB), 80dB cross mod rejection, 90dB desensitisation immunity (at 20kHz off at 14MHz). Audio Peak and separate notch tuning. Negative RF feedback on 6146B stage (-31dB 3rd order). RF processor, VOX, Curtis electronic keyer, tune button (10sec on full power), PLL VFO with memory for any Tx, Rx or T/Rx frequency. Modular plug-in construction, permability tuning (for new band allocations) 25kHz calibrator, 20dB switchable attenuator, sidetone, clarifier and an advanced noise blanker are all features of the FT901.

FT101ZD PERFORMANCE AND ECONOMY



FT101Z

FT101ZD Transceiver Digital £575.00

FT101Z Transceiver Analogue £500.00

Count Analogue/Dig. Kit £80.00

DC-DC 12V Inverter Kit £30.00

A hybrid HF transceiver, 160-10M (+ WWV Rx + Aux). 234V AC and 12V DC (inbuilt inverter option). SSB, CW and AM, 180W PIP from a pair of 6146B with negative feedback. Analogue and "mode sensitive" digital readout to 100Hz. Continuously variable IF bandwidth 300Hz-2.4kHz plus optional "basic fixed" of 350/600Hz. Full equipment includes: adjustable level RF processor, advanced adjustable level noise blanker, front panel adjustable VOX, semi break-in with side tone, 0-10 20dB attenuator, switchable AGC, Slow/fast/off, clarifier (RIT) selectable on Tx, Rx or both, etc., etc. The FT101ZD is compatible with nearly all the FT901 accessories listed above - morse reader and video display, monitor scope with pad adaptor, 3band transverter, ATU, linears, speakers, and a choice of synthesized or conventional (NEW FV101Z) external VFOs.

GENERAL COVERAGE RECEIVERS



FRG7
£185

FRG7 For Amateur Band listening or short wave broadcast monitoring, the FRG7 should be your first choice, since in its price range, the specifications are unsurpassed. It incorporates a triple-mix drift cancelling loop for continuous spin-tuned coverage of 0.5-30MHz. Mains or DC operated. Also available the full spec internally incorporated digital counter model: 100Hz readout (100fold improvement) FRG7D only £235.00.

FRG7000 The Deluxe general coverage receiver, equally suited for short wave broadcast monitoring or amateur bands. Digital readout to 1kHz 0.25-30MHz + switchable selectivity, extremely sensitive (0.7uV for 10dB's/N) and stable. Included 24 hour digital clock for both local and GMT time. Features automatic receive and/or tape recorder facility.



FRG7000
£327

PRICES EXCLUDE VAT (15%) BUT INCLUDE DELIVERY - SECURICOR/POST IN THE UK

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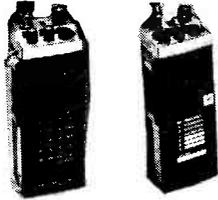
AGENTS STOCK AND SALES

G3ZUL	Brian	Stourbridge	(03843)	5917
G13KDR	John	Bangor	(0247)	55162
GM8GEC	Jack	Edinburgh	(031665)	2420
G13WVY	Mervyn	Tandragee	(0762)	840656
GW3TMP	Howarth	Pontybodkin	(035287)	846/324
GW4GSW	Alan	Wansea	(0792)	24140

Communications Ltd

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FT207R Transceiver £173.04
NC 1A Slide-in charger £16.50
NC 2 Charger eliminator £34.50

NC 9C Small charger £6.50
NBP 9 Nicad packspare £14.50
FBA 1 Pack/charger adaptor T.B.A.

FT207R — FT202R HANDHELDS

The FT207R is a microprocessor controlled synthesized handheld that provides 2.5kHz channel steps!! 4 memory channels are provided and these may, as can the whole band, be scanned. Any one of the memories can be used as a priority channel. Simply operate as normal on any frequency, designate one of the memories as priority, and every few seconds, for a few milliseconds, the set will check occupancy of the channel. All frequency entry is by the keyboard (which includes touch tone). The readout displays frequencies (to 100Hz), memory channel number and 'P'. Switches are provided for keyboard lock (prevents accidental operation) and display 'time-out'. A 600kHz shift, and any programmable split, is available, both of course plus and minus. Memory back-up is provided but can be switched off for long-term storage. 2.5W + 200mW outputs and a whole host of accessories complete the brief specification of this exciting transceiver.

The FT202R is an economical 6 channel handheld physically similar to the FT207R.

YM24 Speaker/mic £6.50
Heavy duty case T.B.A.
AA nicads, each £0.87

£14.50
T.B.A.
£16.50

FT202R Transceiver £103.50
NC 1 AC charger '202 £16.50
PA-1 12V PSU '202 £16.50

FT225RD MULTIMODE 2 METRES



FT225RD Transceiver £485.00

FT225R Transceiver £445.00

MEM memory £85.00

COUNT Counter £50.00

144-146-148MHz, USB, LSB, AM, FM, CW (semi-break-in with side tone). Smooth dual speed VFO control and 11 (x4) crystal channels. Simplex and (auto tone burst) repeater, 600kHz and auxiliary shifts both up and down. Single signal mix, with phase locked conversion oscillator, for spurious free output. Mains 234-100V 50/60Hz and 12V DC for world wide portability. Excellent selectivity, SSB 2.4kHz with 1.75:1 SF, FM 12kHz at 6dB. High sensitivity with modern MOSFET RF stage. Good strong signal handling by careful gain distribution, mixer and crystal filter design. High power output 10W AM, 1.25W CW and FM, SSB 25W + + with great reliability and low IMD's. Mode sensitive digital readout to 100Hz and easy to service superior plug in board construction. Front panel controls for SSB mic gain, FM power, squelch, Vox/Mox sensitivity, noise blanker, AGC, readout brightness, meter functions (S/centre plus relative power) etc. etc. Digital and Analogue versions and memory option.

FT227 SYNTHESIZED AND MOBILE



FT217RXS Transceiver £252.17

FT227RBS Transceiver £247.82

FP4 12V 4A PSU £35.00

YD148 Desk mic. £18.50

The FT227s are 10W output 2 metre transceivers whose receiver performance -- sensitivity and immunity to overload has become the standard against which others are compared. They use a signal knob (photo interrupter) to control the synthesiser, which basically turns in 10kHz steps with a 5kHz 'fill in' oscillator.

FT227RXS an FT227R fitted with SMC's scanner. This maintains all the normal features of the 227 but the neat internal installation provides automatic tuning from 145 to 146 in 25kHz steps. When finding an occupied frequency the scanner pauses for about seven seconds and if not held will move on. A flick of the P.P.T. will lock out one (or all) uncleared channels next scan around. FT227RBS an FT227RB fitted with SMC's stepper. A four channel memory is provided in this model and tuning may also be accomplished by push buttons on the microphone. A single push moves the transceiver 25MHz, hold the button down for 3 second and it scans the band until a station is found.

SECONDHAND BARGAINS

Guaranteed Carriage Free + VAT 15%

HF Transceivers	HF Receivers	VHF/UHF Transceivers	FTV250 Transverter Yaesu	£130.00
TR4/MS4 Drake	FR101DD Yaesu	IC21 + VFO (25.00) Icom	SB640 Dig. Display kit	£40.00
FT501/FP501 Yaesu	SPR4 Drake		KW200 DC PSU KW	£30.00
FTDX401 Yaesu	KW202 KW		QT824 World Clock Yaesu	£10.00
FT101 Yaesu		FT202R Yaesu	FV200 VFO Yaesu	£50.00
HF Transmitters	General Coverage Receivers	KP202 Ken	FTV6508 Transverter 4mtrs	£125.00
HL101 Yaesu	SMC73 SMC	Liner 11 Belcom	MAGNUM M2 Transverter VHF E.D.	£90.00
	VHF Receivers	FT224 Yaesu	YC500J Freq. Counter Yaesu	£150.00
	SR9 Marine Daiwa	FTC212 Yaesu	VC601 Dig. Read-out Unit Yaesu	£100.00
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BT1	Medium Duty	£79.50
CD44	Medium Duty	£95.00
CD45	Medium Duty	£99.00
HAM IV	Very Heavy Duty	£145.00
T2X	Ultra Heavy Duty	£190.00
2050	VHF/UHF Memomatic	£37.50
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For antennas to
3 sq. ft. (tower)
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80W out for 10W nominal drive. 145MHz. 12V DC (circa 10A). Switchable, SSB/FM Hang time, RF or manual cont. Low noise pre amp. Remote control unit available. B108. (Post free.) **£99.00**



WATT METERS

LDM885 Through line (illus.): 1.8-54MHz 20-200-2000W FSD (P&P 75p) **£44.50**
LPM880 Absorption. 1.8-500MHz. 5-20-120W. FSD (p&p 95p) **£69.00**



HF BALUN TRANSFORMER HIQ

1:1 Ratio. 3-40MHz. SO239 (UHF) Socket 5½ x 1½" D. 7½ozs. "Hang up type". High power handling. HIQ (Post free of charge) **£8.70**



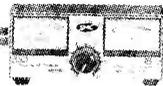
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12 Chan. FM Monitor. 2½" x 1½" x 4½" 8ozs. 12KHz BW. 130-170MHz. **£50.00**
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HF 12A12 c/w S (20-23), (R10-7) **£70.00**
HF 12M9 c/w 16, 6, 8, 10, 67, M, 12, 14 **£66.95**



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20K ohms per volt. 1000X overload on ohms. Plug in range selection. 80 Microtest 40 Ranges **£16.50**
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Twin Meter. 3.5 to 170MHz. Calibrated to 3:1 SWR. 50ohms. Relative power. SO239 sockets. T3-170L (p&p 60p) **£11.25**



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100KHz to 30MHz. 12V DC operation 5-7 segment displays resolves to 10Hz only 6½ x 2½ x 5½". RT75D (p&p free). New Low Price **£38.26**

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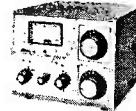
V.H.F. LINEAR AMPLIFIER

160W out for 15W maximum drive. 145MHz. 12V DC (circa 18A). RF or manual switching. SSB/FM. Excellent heat sink — over temp.; trip out/reset with LED. PA15-160BL. (Post free.) **£178.50**



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3.5-30MHz. 50/75 ohm Coax (VSWR<5:1) and Single Wire (10-250ohms) transformed to 50ohms. To 500W PIP SSR Wattmeter 20+250W FSD LAC895 (p&p free) **£80.50**



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1.5-250MHz on fundamental. c/w earphone. battery. 6 plug in coils. 1.15MHz crystal set. 2kHz modulation. LDM815 (p&p free of charge) **£45.00**



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50ohm, 9-12V, BNC (p&p free). MMC-28-70-144/IF **£19.00**
MMC-70-144/IF/LO **£21.00**
MMC-432/IF/S **£26.00**
MMC-1296/IF **£26.00**



COAXIAL RELAYS

12V DC operation, 50ohms. 1KW PEP at 30MHz 50dB isolation at 1 GHz. 0.2dB loss at 0.5GHz. (p&p free of charge).

CX540D	3BNC Sockets	£18.50
CX530D	3BNC + 1 'N'	£18.50
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CX120A	50W Cable entry	£9.30
CX120P	50W Pin connection	£9.30



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SMCHF5, 80, 40, 15, 10 metres. 500W PEP 10-20M, 200W 40-80M 50ohm coax feed. With/without radials, or use trapped radial kit. Securicor delivery on either or both together **£3.00**.

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105BA	10m	5 element yagi	18.5'LE 24'8"	£92.00
153BA	15m	3 element yagi	23.0'LE 12'8"	£62.75
155BA	15m	5 element yagi	24.5'LE 26'8"	£117.50
203BA	20m	3 element yagi	35.0'LE 16'8"	£117.50
204BA	20m	4 element yagi	36.5'LE 26'8"	£155.00
205BA	20m	5 element yagi	36.5'LE 34'8"	£205.00
402BA	40m	2 element yagi	43.0'LE 16'8"	£158.00
DB 10-15A	10-15m	3 element yagi	23.0'LE 13'8"	£116.00

GEM QUAD Fibreglass 10-20m (Carriage £2-£9) +VAT 15%

G02E	2 Element quad	£124.00	G04E	4 Element quad	£245.00
G03E	3 Element quad	£187.00	G0CK1	1 Element Conversion kit	£63.00

MOSLEY Triband Beams (Carriage £3.50) +VAT 15%

TA32	2 ele. 200W RMS	£70.00	MUSTANG2	2 ele. 1KW RMS	£106.00
TA33	3 ele. 200W RMS	£105.00	MUSTANG3	3 ele. 1KW RMS	£130.00

G-WHIP HF Mobile Antennas (Carriage £0.95) +VAT 15%

Tribander	10-20M Slide	£21.50	Flexwhip	10M Mast	£15.00
LF Coil	40/80/160M	ea £5.70	FF	15/20/40/80/160M	ea £5.70
LF Whip	Telescopic	£2.90	GW Base	Standard Base	£3.90
Multibeam	10-20M Auto	£25.00	35 Base	Heavy Duty base	£5.00
MM Coil	40/80/160M	ea £5.70	TA	35 to G-Whip	£0.80
MM Whip	Telescopic	£2.90	Extended	Extension	£10.00

ASCOT ANTENNAS VHF Mobile (Carriage £0.95) +VAT 15%

340	3/4	Standard Base	£2.10	085	3/4 & 3/8	Cable Assembly	£2.80
310	3/4	Swivel Base	£3.50	095	3/4 & 3/8	Fibreglass Mount	£2.10
344	3/4	Sprung Base	£5.55	092	3/4 & 3/8	Magnetic Mount	£8.95
340	3/4	Standard Base	£3.50	084	3/4	Cable Assembly	£4.15
330	3/4	Swivel Base	£4.45	088	3/4	Cowl Mount	£4.95
341	3/4	Sprung Base	£6.65	091	3/4	Magnetic Mount	£9.80
350	3/4	Fine Tune Base	£7.15	089		Gutter Mount	£4.75
351	3/4	Sprung 350 Base	£8.25	093		Boot mount	£2.90
057	1/2m	Tapered Whip	£1.95	031		Blank off 3/4 & 3/8	£0.80
056	63cm	Parallel Whip	£0.95	044		Blank off 3/4	£0.45

BANTEX VHF Mobile Antennas (Carriage £0.90) +VAT 15%

42SS	3/4	4m Stainless whip	£1.75	B5U	3/4	70cm whip	£2.15
40GF	3/4	4m Glass whip	£3.65	UCL	3/4 & 3/8	70cm Colinear	£6.85
20SS	1/2	2m Stainless whip	£1.40	UOL	3/4 & 3/8	70cm Colinear	£13.65
18GF	3/4	2m Glass whip	£2.75	BM		Standard base 3/4	£2.15
B5	3/4	2m Glass whip	£7.65	BC		Claw base	£3.90
BGASS	3/4	2m Stainless whip	£7.00	B0		Trunk lip base	£7.00
BGAGF	3/4	2m Glass whip	£8.25	BMM		Magnetic base	£12.35

SMC-HS (Carriage Extra) +VAT 15%

SMC15SE	3/4	15m	1.72m	£11.00	G0X2	Discose 50-580MHz	£39.50
SMC10SE	3/4	10m	1.72m	£11.00	G0X1	Discose 80-480MHz	£37.50
SMC2NE	3/4	2m	1.30m	£11.00	TBA	VHF Rx Discose 65-520MHz	£15.00
SMC7BF	3/4	2m	1.75m	£11.00	LT606	Log Par. 50-500MHz	£75.95
SMC7BB	3/4	2m	1.72m	£11.00	VS BNC	Helical 145MHz BNC	£3.85
SMC25B	3/4	3/4	70cm 0.94m	£10.00	145PL	Helical 145MHz PL259	£3.00
RG4M				£3.00	156PL	Helical 156MHz PL259	£4.35
GSS				£5.00	GPV-5	Colinear 145MHz 6.5dB	£21.74

JAYBEAM VHF Fixed Ants (Carriage about £1.00) +VAT 15%

4Y/4M	4 element yagi	£14.95	5XY/2M	5 element crossed	£18.00
PMH2/4M	2 way harness	£10.60	8XY/2M	8 element crossed	£22.50
O15/23	15 over 15 slot	£26.90	10XY/2M	10 element crossed	£29.80
UGP/2M	Ground Plane	£6.15	PMH2/C	Circular harness	£5.90
C5/2M	Vert Colinear	£34.80	PMH2/2M	2 way harness	£7.80
5Y/2M	5 element yagi	£8.90	PMH4/2M	4 way harness	£18.70
8Y/2M	8 element yagi	£11.50	C8/70	Vert Colinear	£39.50
10Y/2M	10 ele long yagi	£24.70	O8/70	8 over 8, slot fed	£17.80
14Y/2M	14 ele long yagi	£31.50	PBM18/70	18 ele Parabeam	£21.50
PBM10/2M	10 ele Parabeam	£29.20	MBM48/70	48 ele Multibeam	£24.50
PBM14/2M	14 ele Parabeam	£35.50	MBM88/70	88 ele Multibeam	£32.60
O4/2M	4 element quad	£18.70	8XY/70	8 element crossed	£27.50
O6/2M	6 element quad	£24.80	12XY/2M	12 element crossed	£33.00
O5/2M	5 over 5, slot fed	£15.90	PMH2/70	2 way harness	£6.75
O8/2M	8 over 8, slot fed	£21.60	PMH4/70	4 way harness	£14.30

12AVQ	10-20m	Trapped vertical	14'H	£37.50
14AVQ/WB	10-40m	Trapped vertical	18'H	£52.50
18AVT/WB	10-80m	Trapped vertical	25'H	£76.00
14RMC		Roof kit for 12, 14 & 18		£19.50
18V	10-80m	Loaded vertical	19'H	£27.00
18HT	10-80m	Hy Tower "stubbied"	50'H	£225.00
TH2MK3	10-20m	2 element yagi	27.3'LE 6'8"	£109.75
TH3JNR	10-20m	3 ele 600W yagi	24.2'LE 12'8"	£113.50
TH3MK3	10-20m	3 element yagi	27.0'LE 14'8"	£157.00
TH60XX	10-20m	6 element (total)	31.1'LE 24'8"	£205.00
HY quad	10-20m	2 element quad	13.5'TR 8'8"	£169.00

SMC Trapped Dipoles 10-80M (Post £1.50) +VAT 15%

S500	Standard - 14 SWG	£26.50	P500	Portable - Cu/Terylene braid, ciw 75ft feeder	£32.50
HP1K	High Power - 14 SWG	£29.50			

MINI-BEAM (Carriage £2.50) +VAT 15%

MB10-20	New Minibeam		HDI Miniquad 10-20m; only 6ft 2m radius	£83.85
10-20m; only 6ft radius		£69.50		

CABLES RF Feeders (Carriage extra) +VAT 15%

RG58U	50Ω 0.2" Stranded	yd £0.18	307EP	75Ω "Economy"	yd £0.12
UR43	50Ω 0.2" Solid	yd £0.17	UR70	75Ω 0.225" Stranded	yd £0.18
UR76	50Ω 0.2" Stranded	yd £0.17	UR39	75Ω 0.306" Medium	yd £0.27
UR67	50Ω 0.405" Heavy	yd £0.45	UR57	75Ω 0.405" Heavy	yd £0.45
RG213	50Ω 0.405" Heavy	yd £0.42	302	75Ω Flat twin	yd £0.11
306	300Ω Ribbon	yd £0.12	3K21	240Ω Oval twin	yd £0.08

COAX PLUGS UHF (Post and packing £0.20) +VAT 15%

PL259	Standard UHF plug	£0.48	SO239	Free angle UR43	£0.88
UG175/U	Reducer UR43	£0.12	PL258	Back back, female	£0.79
UR176/U	Reducer UR70	£0.12	PL274	Back back, chassis	£0.93
PL259R	"Reduced" plug	£0.58		Back-back, male	£1.20
PL259SL	"Solderless" UR67	£0.55	M359	Angle (1m + 1ft)	£0.93
PL259SS	"Solderless" UR43	£0.55	"T" (3 females)		£1.48
PL259P	Push-on plug	£0.69	M358	"T" (2 fem, 1 male)	£1.20
PL259E	Elbow plug UR43	£0.83		4-way (3 fem, 1 male)	£1.85
	Panel mount PL259	£0.93	SO239	Car + phone	£0.60
SO239F	4 hole socket	£0.42	SO239/2.5mm Jack		£0.69
SO239T	2 hole socket	£0.42	SO239/3.5mm Jack		£0.69
SO239M	Socket "nut" inside	£0.51	255/U	SO239/BNC male	£1.53
SO239N	Socket "nut" outside	£0.51	273/U	SO239/BNC female	£1.53

COAX PLUGS BNC (Carriage £0.20) +VAT 15%

UG88	Plug, Std UR43	£0.54	UG491	Double male	£0.93
UG959	Plug, Large UR67	£2.66	UG274	"T" 2 female, 1 male	£1.44
UG920	Socket, 4 hole stand	£0.56	"T" 3 female		£1.74
UG1094	Socket, Nut fixing	£0.56	UG306	Elbow adaptor	£1.62
UG989	Socket, Free, UR43	£0.72	255/U	BNC male/SO239	£1.53
UG914	Double female	£0.93	273/U	BNC female/PL259	£1.53

MASTING (Carriage EXTRA) +VAT 15% (In B. Max. 20' Max. BRS 13')

1 3/4" od	Aluminium 16g	ft £0.42	2"	Al. Thick wall 1 3/8"	£1.05
1 1/2" od	Aluminium 16g	ft £0.46			

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SMP3	3 hole guy plate 2"	£0.85	SMB43	3 hook band	£1.15
SMP4	4 hole guy plate 2"	£1.55	SMB151	4 hook band 2"	£1.65

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3mm	HT steel, 0.63T	yd £0.18	X150	Galvspanned, 1" D	490' £16.30
4mm	HT steel, 1.5T	yd £0.24	7X18g	Ru/Aluminium	100' £4.40

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3/8"	BS150 lbs (cir)	yd £0.07	3/4"	BS1250 lbs (cir)	yd £0.14
1/2"	BS650 lbs (cir)	yd £0.10	1"	BS2450 lbs (cir)	yd £0.27

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W12	12" bracket	pair £6.50	W21	21" bracket	pair £9.50
W18	18" bracket	pair £8.75	W24	24" bracket	pair £11.50
W18H	18" Heavy duty	pair £11.75	W24H	24" Heavy duty	pair £14.25

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SMC53	1-2" mast, 1" boom	£1.10	JBL73	1-2" mast, 1 1/2" boom H.D.	£1.50
SMC63	1-2" mast, 1 1/4" boom	£1.25	CP1	2" x 2", 6" x 6" plate	£2.30

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TR2300 2m FM portable 80ch. £166.75 (4.50)
MB2 Mobile mount (2300) £17.25 (1.00)
TS180s 160-10m solid state
transceiver £679.65 (4.50)
TR3200 70cm portable 3 ch. fitted £140.00 (4.50)

YAESU

FRG-7 General coverage receiver £210.00 (N/C)
FRG-7000 Digital readout receiver £375.00 (N/C)
FT101Z Transceiver £575.00 (N/C)
FT101ZD Digital Transceiver £649.00 (N/C)
FT7B 50w Mobile Transceiver £399.00 (N/C)
FT225RD 2m Transceiver £557.00 (N/C)
FT202R 2m hand held £119.00 (N/C)
FT207R Scan hand held £198.00 (N/C)
QTR-24D World Clock £25.80 (N/C)
FT272R Scan 2m Transceiver £263.00 (N/C)

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MMC 144/28 LO converter £24.15 (N/C)
MMC 70/28 converter £21.85 (N/C)
MMC 70/28 LO converter £24.15 (N/C)
MMC 432/28 S converter £29.90 (N/C)
MMC 432/144 S converter £29.90 (N/C)
MMC 1296/144 or 28 converter £32.00 (N/C)
MMC 28/144 10m up converter £20.70 (N/C)
MMD 050/500MHz counter £69.00 (N/C)
MMA 144 2m pre-amp £14.90 (N/C)
MMD 500P 500MHz pre-scaler £23.00 (N/C)
MMV 1296 varactor tripler £34.50 (N/C)
MML 144/100w linear amplifier £142.50 (N/C)
MML 432/100w linear amplifier £228.85 (N/C)
MML 144/25w £48.30 (N/C)

SEM

2m converters £23.00 (N/C)
70cms converters £23.00 (N/C)
2m pre-amp £13.22 (N/C)
2m auto switching pre-amp £17.83 (N/C)
70 cms auto switching pre-amp £20.90 (N/C)
2m PA3 pre-amp £8.00 (N/C)
70cm PA3 pre-amp £10.00 (N/C)
2m 48 watt linear/pre-amp £66.70 (0.95)
SQ23q sockets £1.73 extra
HF auto pre-amp 2.40MHz £14.95 (N/C)
HF pre-amp 2.40MHz £10.90 (N/C)
HF Z-MATCH ATU 80-10m £40.25 (1.00)
VHF MONITOR Rx's
TM56B 12v/240 AC auto scan 10
ch's £106.00 (N/C)
TM56B Marine model £115.00 (N/C)
SR9 12v DC Amateur model £46.00 (N/C)
Extra xtals £2.45 (N/C)
FDK
Multi 3000 2m All mode £519.00 (N/C)
Multi 800D 2m 25 watts £249.00 (N/C)
Multi 700E 2m 25 watts £195.00 (N/C)
Multi Palm II 2m handheld £99.95 (N/C)
Multi Palm II 70cm handheld £159.00 (N/C)
M-11/Q16 xtals £5.00 Palm II & IV
xtals £3.00
Multi-Palmsizer 2m synthesised 40
channel handheld £149.00 (N/C)
PIV 70cms handheld £159.00 (N/C)

DENTRON

MLA 2500 160-10m 2Kw linear £699.00 (N/C)
MT3000A 3Kw 160-10m tuner £275.00 (N/C)
MT2000A 3Kw 160-10m tuner £175.00 (N/C)
160-10AT Supertuner 1Kw £99.95 (N/C)
JR Monitor 160-10m tuner 300w £59.95 (N/C)
W-2 160-10m PEP/SWR meter £59.95 (N/C)
MT200A Transceiver £399.00 (N/C)
1Kw 80-10m linear 240v GLA1000 £295.00 (N/C)

AR

AR240 Synthesised hand-portable £199.00 (N/C)
MIZUHO
2m SSB 1 watt portable £165.00 (N/C)
Extra xtals £3.00

NAIGAI

2200 2m 500w PIP linear £485.00 (N/C)

ADONIS MICROPHONES

AM802G Compressor - 3 outputs £59.95 (N/C)
AM502G Compressor - 1 output £39.95 (N/C)

HF ANTENNAS

HQ 120-15 10m mini-quad £96.50 (2.50)
C4 20-15 10m vertical £48.50 (2.00)
Mosley 2Kw version £129.00 (2.00)
TA32 600 watts 20-15 10m £81.00 (2.00)
TA33 600 watts 20-15 10m £118.00 (2.50)
Mustang 2Kw 20-15-10m £135.00 (2.50)
Hy-gain 12 AVQ 20-15-10m £43.00 (2.00)
Mustang 2Kw 20-15-10m £135.00 (2.50)
Hy-gain 12 AVQ 20-15-10m £43.00 (2.00)

All prices include VAT at 15%
Carriage costs shown in brackets

Hy-gain 14 AVQ 40-10m £60.00 (2.00)
Hy-gain 18 AVT/WB 80-10m £87.00 (2.25)
Mosley TD3JR 20-15-10m dipole £26.00 (1.00)
Mosley RD5 SWL ham dipole £31.00 (1.00)
EL-40X 80-40 Mini dipole £39.50 (1.00)
HF5 5 band vertical £41.50 (1.00)

VHF ANTENNAS (JAYBEAM)

4Y/4M 4el yagi £17.20 (2.00)
C5/2M 5db collinear £40.00 (2.00)
5Y/2M 5el yagi £10.25 (1.50)
8Y/2M 8el yagi £13.25 (1.50)
10Y/2M 10el yagi £28.40 (2.00)
PBM10/2M 10el parabeam £33.60 (2.00)
PBM14/2M 14el parabeam £40.80 (2.50)
5XV/2M X'd 5 element £20.70 (1.50)
8XV/2M X'd 8 element £25.85 (2.00)
10XY/2M X'd 10 element £34.30 (2.00)
Q4/2M 4el quad £21.50 (1.50)
Q8/2M 8el quad £28.50 (2.00)
D5/2M 5 over 5 £18.30 (1.50)
D8/2M 8 over 8 £24.85 (2.00)
SVMK vertical Kit £6.60 (1.25)
UGP/2 Ground plane £9.35 (1.25)
HO/2M 2m halo £4.25 (0.75)
HM/2M Above with 24" mast £5.05 (0.75)
C8/70cm 8db collinear £45.40 (2.50)
D8/70cm 8 over 8 £20.45 (2.00)
PBM18/70 18 el parabeam £24.75 (2.00)
MBM/43 70 el Multibeam £28.20 (2.00)
MBM88/70 88 el Multibeam £37.50 (2.00)
8XY/70 8 el X'd yagi £31.05 (1.50)
12XY/70 12 el X'd yagi £38.50 (2.00)
D15/1296 15 over 15 £30.95 (1.50)

ACCESSORIES

9502 rotator £55.80 (1.75)
KR400 rotator £105.80 (2.00)
AR40 rotator £54.50 (1.50)
Stolle 2030 rotator £55.00 (1.50)
Stolle 2010 rotator £50.00 (1.50)
CDE44 rotator £109.00 (2.00)
HAM-M Mk III rotator £159.50 (2.00)
Shure 444 microphone £27.50 (0.75)
Shure 201 microphone £11.75 (0.75)
Shure 526T microphone Type II £36.35 (0.75)
Hand horse key £9.70 (0.50)
EK121 Electronic "Bug" £31.00 (0.75)
50ohm balun £11.25 (0.50)
UR67 per metre £0.62 (0.05)
UR43 per metre £0.22 (0.03)
5 core cable per metre £0.30 (0.03)
HP3A high pass filter £3.00 (0.20)
Drake low pass filter £18.40 (0.75)
TV1 ferrite rings £0.35 (0.05)
Plastic antenna insulators £0.25 (0.05)
Twin SWR meters 3-150MHz £13.50 (0.50)
JAYBEAM (HF)
TB 3 ele 2Kw Beam £155.00 (2.00)
VR3 Triband vertical £39.00 (2.00)
HILOMAST LTD
PNAM-1 Telescopes to 9m £304.75 (18.00)
PNAM-2 Telescopes to 144m £371.00 (18.00)
SAE for details.

MONDAY-SATURDAY 9-5.30 **THE COMPLETE HAM RADIO CENTRE** EARLY CLOSING WED 1.00pm
18/20 MAIN ROAD, HOCKLEY, ESSEX Telephone (03704) 6835 Telex 897406
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WATERS & STANTON ELECTRONICS

FDK NEW
UNITED KINGDOM

SPRING COLLECTION!

**MULTI 700EX 25 WATTS 2M FM 25 & 12½kHz CHANNELS
PRIORITY
SCANNING**

**Price
T.B.A.**

**Delivery expected
April**

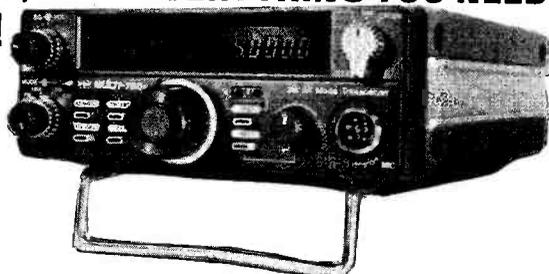


The Multi 700EX is the replacement for the Multi 700E, having an updated specification — without making it too complex for safety under mobile conditions! Its powerful 25 watts output has been retained together with the front panel continuously variable power control. The frequency range has been expanded to cover the entire band 144-146MHz in 25kHz steps. Of course, essential to all current equipment is its ability to operate on 12½kHz channel spacing and this you can do at the press of a button. Four priority channels that are user programmable have been added and these can be electronically scanned. The channels are not lost when the equipment is switched off! The stable crystal controlled tone-burst is automatic and both normal and inverse repeater operation is possible at the press of a button. By simple alteration of the diode matrix the plus 600kHz facility can be changed to 1.6MHz for operation through the proposed FDK 70cms transverter (in matching cabinet). Altogether a simple but highly effective mobile transceiver that provides everything you could wish for in a 2 metre FM mobile.

**MULTI 750 15 WATTS FM/SSB/CW — EVERYTHING YOU NEED
AT A VERY SENSIBLE PRICE!**

**This rig will really set the pace for
1980 — wait until you hear the price!**

Delivery expected April



The Multi 750 is FDK's new, all mode 2 metre unit for both base or mobile use. Using the same cabinet dimensions as the M700EX, this really does provide the basis for an action-packed, go-anywhere station. To list all its features would be impossible in the space available on this page. However, we will list its main points so you can get some idea of just what this amazing package is capable of.

144-146MHz at 10 WATTS OUTPUT (Minimum!); ALL MODES — FM/USB/LSB/CW; REPEATER OPERATION — normal or reverse with automatic crystal controlled tone-burst; DUAL VFO's — these are selectable at the press of a button so that one vfo can be left at the SSB end of the band and the other at the FM end; NOISE BLANKER — a really efficient circuit to take out those ignition pulses on sss; DUAL SPEED TUNING — enables 1kHz or 100Hz step tuning on SSB/CW and 1kHz or 5kHz steps on FM; RIT — essential for accurate tuning of the received SSB signal; LOW EFFECTIVE PRICE — at present we cannot tell you what the final price will be — suffice to say it will be extremely competitive — so much so that we would strongly recommend you to hold back on purchasing a similar unit until we unveil our SUPER LOW PRICE PACKAGE!

WATERS & STANTON ELECTRONICS



All major items delivered by Securicor within
24 hours

A NEW EXPERIENCE — R1000



TRIO

R1000

TRIO

The R-1000 uses an advanced PLL system in an up-conversion scheme to a high (48MHz) first IF to remove any possibility of image responses. The receiver covers the entire frequency range from below 200kHz right up to 30MHz in 30 bands, each 1MHz wide. The bands are selected, not by ambiguous knob twiddling as in receivers using the Wadley loop but by a 30 position band switch which controls the PLL system.

The band switch also electronically selects the appropriate band pass filter network in the RF stages of the receiver so there are no "preselector" or "antenna trim" controls to twiddle — simply set the band switch to the range required — that's it!

A highly stable VFO tunes each 1MHz range and its linear, back lit scale makes readout easy. However, in addition to this dial, Trio have also provided 5 digit true frequency digital readout so as to guarantee spot on accuracy on any frequency. As a further feature, the digital display can also be switched to read time, this being derived from a quartz standard. Marvellous for accurate log keeping. The display uses high intensity readout units which can be dimmed for use in low light conditions.

As for what else is inside this superb instrument — selectivity is catered for by three custom made IF filters; a 12kHz wide AM filter; 6kHz narrow AM filter; and a new 2.7kHz SSB filter with a

shape factor of better than 1:2 6:60dB. Selectable sidebands are available at the touch of a switch.

For the first time in mid-price receiver, a true noise blanker is provided to remove pulse type ignition noise.

To minimise front end overload, a step RF attenuator is included which gives 0-60dB attenuation in four steps.

All the rear panel connectors are recessed on a sloping panel so that you can stand the receiver either on its back, or pushed hard against a wall when used in conventional shelf mounting. The antenna inputs allow the use of either a high impedance wire aerial or a 50ohm balanced input so that the proverbial long lump of wire will work really well with the R-1000.

Up until now we have been taking orders on a waiting list system because of short supply of this item. Hopefully by the time you read this we will be able to supply from stock. And remember all our R1000 are given our full pre-delivery check and then despatched promptly to reach you within 24 hours of us receiving your order. That's real service! Just one of the many things that make more and more people come to us for all their amateur radio needs.

£298 inc. VAT

WATERS & STANTON ELECTRONICS

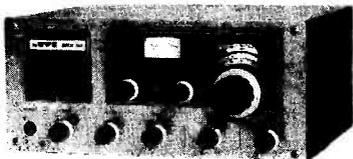
SHORT WAVE LISTENERS . . . OUR RECEIVERS ARE BETTER—WHY!

In choosing a receiver you'll want to be sure that you're making the right choice. There's quite a few to choose from but do not fall into the trap of thinking that a receiver produced by any of the large domestic hi-fi manufacturers and purporting to be a "true short wave or communications receiver" is necessarily a sound investment! We've been in the communications business long enough to know the good ones from the rest. Listed below are the ones we can recommend as best buys.

All are produced by acknowledged leaders in the communications field and all will give you hours of satisfactory and enjoyable listening, whether it be amateur or broadcast stations you wish to monitor.

But, to make sure you really are getting the best value for money, it's no good purchasing a sealed box. All the receivers listed below have travelled many thousands of miles and are produced on a production line where final alignment time is limited. That's why we test each receiver carefully before selling it. Our tests involve the use of several thousand pounds worth of instrumentation and it's because of this that we can guarantee you that a receiver purchased from us is quite likely to be better than a similar model purchased elsewhere.

Don't therefore take risks with your hard earned cash. Our advice is free and so are our pre-delivery checks — we can deliver anywhere in the U.K. and can quote competitive H.P. terms and accept telephoned orders against Access or Barclaycard — so if it's a receiver you want, come to Waters & Stanton Electronics, one of the largest amateur radio outlets in the U.K.!



**LOWE
SRX30**

The SRX30 is designed as a budget priced receiver that outperforms many receivers costing 3 times as much. Featuring the Barlow Wadley loop, it will enable you to explore the exciting world of short wave radio — amateurs, broadcast, aircraft, shipping, etc. This is a completely self-contained package, having all the features necessary for complete and reliable coverage of the frequency range 0.5 MHz to 30 MHz.

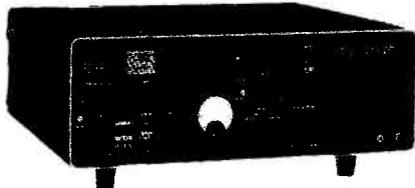
£178 inc. VAT and delivery

Dear Sirs,

Thank you for your most excellent service and unbiased advice when I called in to purchase a short wave receiver. I might say that I did intend to buy in London but when I was told by one dealer that their repairs were done elsewhere, I became suspicious. How confident I was when I saw your large service department — my message to any other customer would be: Go to Waters and Stanton — they have the experience and facilities at their new premises that far exceeds any other retailer in the South I have visited!

R. THOMSON, London, E17

YAESU FRG7000



£375 inc. VAT and Delivery

The FRG7000 is based on the successful FRG7 design with a host of features that make it a deluxe receiver for the really serious short wave listener. Digital readout, electronic clock and timer, superb selectivity all go to make up the receiver that everyone aspires to own. Frequency coverage is 0.2 MHz to 30 MHz and the clear digital readout makes it one of the easiest receivers to use.

FANTASTIC OFFER

FDK 2m 1 watt Portable

Complete with: Flexible antenna, ni-cads, AC charger, S20 and S22, cigar lighter, DC lead and 6 channel capability

£89.50 inc. VAT*

Postage and packing 75p

* Crystal tone-burst £10 extra



MONDAY - SATURDAY 9-5.30

18-20 MAIN ROAD, HOCKLEY, ESSEX

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Tried — Tested and Popular . . .

"New"



IC-240
£169 inc.

The IC-240 is the ideal mobile rig for most people. Apart from the fact that it is quite a lot cheaper than most, it is, in fact, more suitable than many to use in the car while driving (and let's face it, it is under those conditions that most mobiles are used). It can be operated with ease without taking your eyes off the road and provides up to 22 channels (which is more than you are likely to need). Being synthesized, of course, there are no crystals to buy for extra channels. Full repeat, reverse repeat and automatic tone burst plus a low power facility are selectable from the front panel. By adding a 'Superscan' at a later date you can obtain full scanning facilities over the whole band at a VERY competitive price.

The IC-240 is a superbly built and very reliable piece of equipment as witnessed by the many thousands in use. All Icom equipment is built to a very high standard and the IC-240 is no exception. It has an excellently sensitive receiver and a very clean transmitter and will give you hours of headache-free pleasurable use — so why not get one now before the price goes up again!

240 Alone
Less VAT = £167.91 With VAT = £193.00

THE MOBILES

IC-255E 25 watt FM!

- ★ 25 watt output (1 watt low power).
- ★ 5 memories.
- ★ 2 VFOs.
- ★ Built-in scanner (with optional mic for scan control from the mic). Can scan the whole band, a selected portion, or just the memories.
- ★ Normal and reverse repeat — 600 kHz shift built-in plus another user programmable shift, from the front panel (for 70 cm transversing?).
- ★ Size 64 × 185 × 223 mm.
- ★ Price **£255 inc. VAT.**



IC-280E
£250 inc.

★ WITH SCANNER £260

As usual, ICOM have kept ahead with technology and have produced their revolutionary new IC-280E which uses a microprocessor to produce frequencies throughout the 2m band at the ideal 25kHz spacing required today. The IC-280 has the ideal advantage of being separable into two parts for easy mounting into today's cars which so often forget to leave space for a rig. The removable front panel, with all controls, is only 3" deep and will fit in any convenient spot — in the glove pocket, on the dash or even on the sun visor! The main part of the set can be mounted anywhere within 4 feet — or even further in many cases — under the passenger's seat is quite handy! Display is of frequency on an LED readout and there are three memories for your favourite channels. These are not cleared when the set is switched off as long as it is left connected to the car battery.

Less VAT = £217.50 With VAT = £260

AGENTS (PHONE FIRST — All evenings and weekends only, except Barnsley and Burnley)

Scotland — Jack GM8GEC (031-665 2420)

Wales — Tony GW3FKO (0222 702982) Burnley — (0282 38481) Midlands — Tony G8AVH (021-329 2305)

North West — Gordon G3LEQ (Knutsford (0565) 4040) Yorkshire — Barnsley (022678 2517) Evenings
Barnsley (0226 5031) Days



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YOUR SOLE AUTHORISED UK IMPORTER FOR ICOM

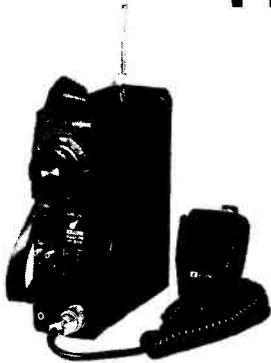
THANET ELECTRONICS LTD.

143 Reculver Road, Beltinge, Herne Bay, Kent (02273 63859)





... Simply the Best ...



IC-215
£162 inc.

The IC-215 is getting more and more popular also as it combines the advantages of a portable, which can be operated anywhere, with the ability to double as a low power base station by virtue of its 3 Watts of output and SO239 antenna connector on the back. Of course there are facilities to operate it from an external power supply, and if it is fitted with Ni-Cads you can arrange to trickle charge these at the same time. The batteries used are of a sensible size being C type (or U11) instead of the 'penlight' batteries used by most of its competitors. This gives at least three times the operating power when you are away from home which you will appreciate if ever you have run out of battery in the middle of QSO! It comes already crystalised up for 12 channels, S20, S22 and all the repeater channels 0 to 9. We think the extra power and larger batteries far outweigh the advantages of having the extra channels produced from a synthesizer.

Less VAT = £140.87 With VAT = £162.00



IC-202S
£169 inc.

ICOM's range of sideband portables has been recently expanded. The well known and tested IC-202E has now been improved in the form of the IC-202S which has lower side band fitted also and provides sidetone on CW. The receiver has been hotted up making it even more suitable for use as a base station, either barefoot or as a prime mover. The new IC-402 is the 70cm version of the 202S giving the same facilities as its 2m cousin over the range 432-435.2 MHz. Both use a very stable VXO circuit, to give fully tuneable coverage of the band a 200 kHz segments and both have extremely clean signals so that using them to drive a linear to the full legal limit presents no problems. We are very impressed with both the 202S and the 402.

IC-202S Less VAT = £146.96 With VAT = £169.00
IC-402 Less VAT = £210.43 With VAT = £242.00



IC-402
£242
inc.

"New"



IC-260E
£369 inc.

IC260E MULTIMODE MOBILE

This exciting new mobile offers you FM, USB, LSB and CW, all in a neat small package. All with a built-in scanner too! Will scan 3 memory channels or scan between two programmed frequencies stopping on a received signal **IN ALL MODES**.

Other features include: Noise blanker, CW break-in, CW monitor, automatic PA protection, microcomputer control, two independent VFOs, tuning steps of 1 KHz and 100 Hz in SSB and CW or 5 KHz and 1 KHz in FM, full frequency readout in bright LED. Fast/slow AGC. don't hesitate to ask for more details.

Phone → or put a message on the ansafone for further details
ALSO AVAILABLE FROM OUR SHOP IN HERNE BAY

MICROWAVE MODULES
STANDARD BEARCAT

WESTERN
G WHIP

ANTENNA SPECIALISTS
YAESU MUSEN

J-BEAM
RSGB PUBLICATIONS

HP AND PART EXCHANGE WELCOMED



IT'S HERE!! AND SHOULD BY NOW BE EX-STOCK **THE MOBILE OF CHOICE FROM THE WORLD FAMOUS ICOM STABLE — THE IC-255E**



**25 WATTS — 5 MEMORIES — SCANNING — 600 KHz AND USER SELECTABLE
 REPEATER SHIFT — FULL COVERAGE IN 5 KHz or 25 KHz STEPS**

We have had a poke around one of these little beauties and are certain that Icom, yet again, have come up with a winner. As you can see, it has the expected smart Icom appearance. Features include: —

- ★ Crystal controlled Tone Burst
- ★ Full band coverage — extendable to 148 MHz if required
- ★ Four digit LED display
- ★ 25 Watts output or 1W low power. A superb receiver using grounded gate FET front end
- ★ Scanning over a user programmable range
- ★ Memory scan
- ★ Stop on empty or busy channels
- ★ Tuning in 25KHz or 5KHz steps
- ★ 5 Memories — retained while the power is connected to the rig
- ★ Built-in 600 KHz Repeater shift
- ★ Alternative programmable shift
- ★ Reverse Repeater facilities
- ★ RIT (± 3 KHz) for those off channel stations
- ★ Good loud audio
- ★ Optically coupled tuning between control knob and CPU
- ★ Multiway 24 pin socket on back for touchpad, computer, or external control (note the current RM3 cannot be used but a new version is to be introduced)
- ★ Rugged modular PA (guaranteed of course!)
- ★ Mobile mount which can be padlocked

At £255 including VAT these are such value for money that demand may exceed supply for a while — but they are worth waiting for! (Delivery is free of course by Registered First Class Letter Post.)

FROM

THANET

OF COURSE



"NEW" IC251E £479 inc.

**DON'T WORRY — WE GUARANTEE
ALL SOLID STATE RIGS
INCLUDING PAs**

AFTER YEARS OF SUCCESS THE IC211E HAS NOW BEEN REPLACED BY THE IC251E. NOT JUST A FACELIFT, BUT A NUMBER OF IMPORTANT DEVELOPMENTS HAVE BEEN INCORPORATED.

MICROPROCESSOR CONTROL — CPU control with Icom's original programs provides various operating capabilities. No backlash dial controlled by Icom's unique photo-chopper circuit. Band edge detector and Endless System provides out-of-band protection. No variable capacitors or dial gear, giving problem-free use. The IC251E provides FM, USB, LSB, CW coverage in the 144-146 MHz frequency range. Thus the IC251E can be used for mobile, DX, local calls, and satellite work.

MULTI-PURPOSE SCANNING — Memory Scan allows you to monitor three different memory channels. Program Scan provides scanning between two programmed frequencies. Adjustable scanning speed. Auto-stop stops scanning when a signal is received in all modes.

DUAL VFO's — Two separate VFO's can be used either independently or together for simplex operation, and any desired frequency split in duplex operation.

CONTINUOUS TUNING SYSTEM — Icom's new continuous tuning system features a luminescent display that follows the tuning knob movement and provides an extremely accurate readout. Frequencies are displayed in 7 digits representing 100 MHz to 100 Hz digits.

Automatic re-cycling restarts the tuning at the bottom of the band when the top is reached — and vice versa. Quick tuning in 1 KHz steps is available, and fine tuning in 100 Hz steps in the SSB and CW modes, and 5 KHz steps and 1 KHz steps in the FM mode, is provided for trouble free QSO.

EASIER OPERATION AND LIGHTER WEIGHT — The most compact, lightest weight all-mode 144 MHz transceiver. First



to use a pulse power supply in communication equipment, for lighter weight. 50 mm-diameter large tuning control knob for smooth and easy tuning. Trouble-free controlling knobs for both receiving and transmitting. LED indicator for transmit and receiving modes.

MOST SUITABLE FOR BOTH FIXED AND PORTABLE STATIONS — Built in 240V AC and DC power supplies. Convenient Dial Lock switch for mobile operation. Easy carry handle. Effective Noise Blanker. IC SM5 high quality stand microphone is suitable for fixed station operation. Powerful audio output 1.5 Watts at 8 ohm, for easy listening even in noisy surroundings.

OUTSTANDING PERFORMANCE — The RF amplifier and first mixer circuits using MOS FETs and other circuits provide excellent Cross Modulation and Two-Signal selectivity characteristics. The IC251E has excellent sensitivity demanded especially for mobile operation, high stability, and with Crystal Filters having high shape factors, exceptional selectivity. The Transmitter uses a balanced mixer in a single conversion system, a band pass filter and a high performance low-pass filter. The system provides distortion-free signals with a minimum spurious radiation level.

MODES — USB, LSB, CW and FM output.

SENSITIVITY — CW and SSB — Less than 0.25 microvolts for 10 dB S + N/N. FM — More than 30 dB S + N + D/N + D at 1 microvolt or less than 0.3 microvolts for 20 dB Noise quieting.

IC-251E Typical Technical Characteristics: General. Numbers of semiconductors: Transistors 99, FETs 12 ICs 37. Diodes 132. Frequency coverage: 143.8000 — 148.1999 MHz. Frequency resolution: SSB 100 Hz steps FM 5 KHz steps. 1 KHz steps with TS button depressed. Frequency Control: Microcomputer based 100 Hz step Digital PLL synthesizer Independent Transmit-Receive Frequency Capability. Frequency Readout: 7 digit LED 100 Hz readout. Frequency stability: Within ± 1.5 KHz Memory channels: 3 channels, any inband frequency programmable. Usable conditions: Temperature: -10°C — -60°C (14°F — 140°F). Operational time: Continuous. Antenna impedance: 50 ohms unbalanced. Power supply requirement: 13.8V DC $\pm 15\%$ (negative ground) 3A max. or 240V AC $\pm 10\%$. Current drain (at 13.8V DC): Transmitting, SSB (PEP 10W). Approx. 2.3A, CW, FM (10W). Approx. 2.3A FM (1W). Approx. 1.0A. Receiving. At max. audio output. Approx. 0.6A. Squelched. Approx. 0.4A. Dimensions: 141mm (h) \times 241mm (W) \times 264mm (D). Weight: Approx. 5.0 Kgs. Transmitter. Output power: SSB 10W (PEP). CW 10W. FM 1 — 10W (Adjustable). Emission mode: SSB (A3J, USB/LSB), CW (A1). FM (F3). Modulation system: SSB

Balanced modulation. FM Variable reactance frequency modulation. Max. frequency deviation: ± 5 KHz. Spurious emission: More than 60 dB below peak power output. Carrier Suspension: More than 40 dB below peak power output. Unwanted Sideband: More than 40 dB down at 1000 Hz AF input. Microphone: 1.3K ohm dynamic microphone with built-in preamplifier and push-to-talk switch. Operating mode: Simplex. Duplex. (Any inband frequency separation programmable). Receiver. Receiving system: SSB. CW Single conversion superheterodyne. FM Double conversion superheterodyne. Receiving Mode: SSB A3J, USB/LSB, CW (A1), FM (F3). Intermediate Frequency: SSB, CW 10.7 MHz, FM 10.7 MHz, 455 KHz. Sensitivity: SSB, CW Less than 0.25 microvolts for 10 dB S + N/N. FM more than 30 dB S + D/N + D at 1 microvolt. Less than 0.3 microvolts for 20 dB Noise quieting. Squelch sensitivity (FM only): Less than 0.4 microvolts. Spurious response rejection ratio: More than 60 dB. Selectivity: SSB, CW More than ± 1.2 KHz at -6 dB point. Less than ± 2.4 KHz at -60 dB point. FM More than ± 7.5 MHz at -6 dB point. Less than ± 15 MHz at -60 dB point. Audio output power: More than 1.5W. Audio output impedance: 8 ohms.

FROM

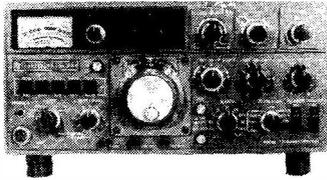
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C5/m. Colinear	£40.02
C8/70cm. Colinear	£45.43
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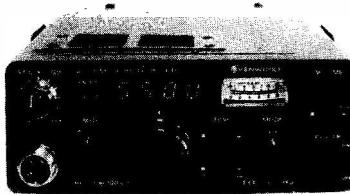
Carriage on Antennas £3.00



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The latest general coverage from Trio. Frequency coverage 200kHz to 30MHz in 30 bands. Using an advanced PLL system. Full digital readout. Three filters 12 kHz for AM - 6kHz narrow AM and 2.7 kHz SSB. Also incorporates a noise blanker. Operation is from 100-240 V AC or 12 V DC.

TR7625



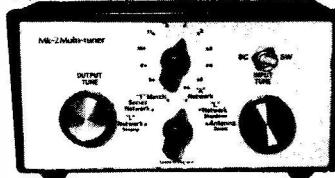
The new TR7625 is a high performance 2m FM Transceiver with memory, designed to permit multi-channel (400 channel) operation. Featuring the ability of repeater operation. This transceiver brings you all the convenience and versatility in both mobile and fixed station operation.

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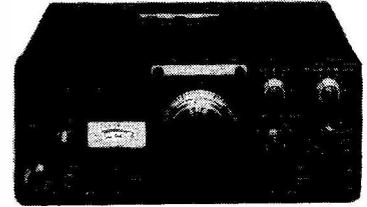
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Yaesu FRG7 Receiver	£214.00
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Bearcat 220 Scanning Receiver	£241.50

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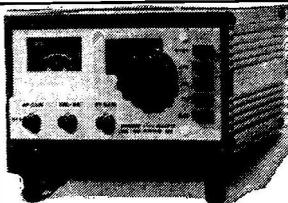
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S.T.E. Prices include VAT and postage

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STANDARD

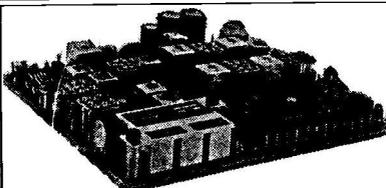
C8800 2M FM Mobile Transceiver £252.00

G-WHIP

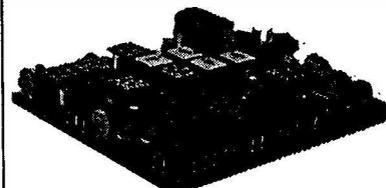
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AR20. 12 channel FM receiver 144-146 MHz. Input impedance 50-75 ohm. AM-FM modes. Sensitivity 0.2uV AF output 3 watts. 12v DC operation Price £50.00



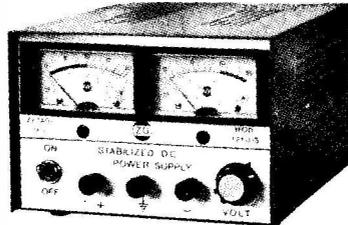
AR23. 12 Channel PM Transmitter. 3 watts 144-146 MHz. Frequency deviation 3-10 kHz adjustable. 12v DC operated AF input sensitivity 2mV adjustable to 50mV Price £50.00



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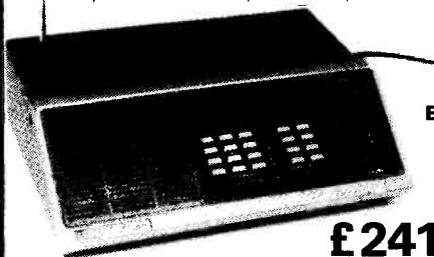
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SHORT WAVE MAGAZINE

(GB3SWM)
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MARCH, 1980

No. 437

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Editor: PAUL ESSERY, G3KFE/G3SWM

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Articles submitted for Editorial consideration must be typed double-spaced with wide margins on one side only of quarto or foolscap sheets. Photographs should be lightly identified in pencil on the back with details on a separate sheet. All drawings and diagrams should also be shown separately, and tables of values prepared in accordance with our normal setting convention — see any issue. Payment is made for all material used, and it is a condition of acceptance that full copyright passes to the Short Wave Magazine, Ltd., on publication.

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17



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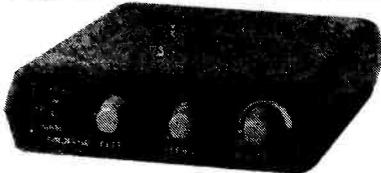
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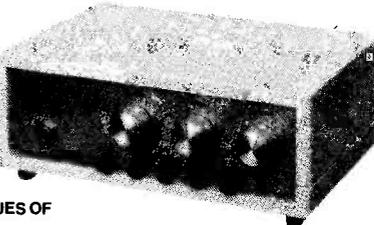
For good measure **UC/1** also adds two-metre coverage to ten-metre receivers. Price: £119.00 plus VAT (£136.85 total).

MODEL FL1

Frequency
Agile
Audio
Filter

AS REVIEWED
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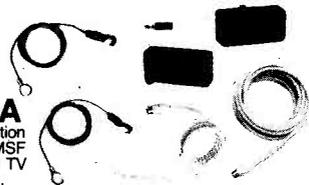


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The
SHORT-WAVE
Magazine

EDITORIAL

New Volume

This issue marks the start of Volume 38 of *Short Wave Magazine*. As most readers will be aware, Volume 37 occurred during a difficult period in the long history of the *Magazine*; however, we have emerged unscathed, fighting-fit and still completely independent and unsubsidised. Indeed it is possible that this independent position is unique among British journals, on any subject, available through the competitive channels of a free market. Be that as it may, we fully intend to retain this status which can only be to the benefit of Amateur Radio: we have no hidden axes to grind.

Before moving on, we would like to say just how much we appreciated the loyalty and patience of *all* our customers while we sorted out our difficulties. We shall do our best not to try you so again for another 36 years!

The April issue will carry the result of the competition for the best article which appeared in Volume 37 (see Editorial, Jan/Feb. 1979 issue). The prize is £50 — so why not have a crack at winning the prize for Volume 38?

Ed. Williams
G3KFE.

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

ONCE again your humble servant reaches for the typewriter to begin writing *CDXN*. On the home front, there'll have to be little "balancing" done by the writer in that he has the main aerial down, along with its stub mast, and all he has to play wireless on is a choice of 14/21 MHz dipoles on a common feeder and a 28 MHz dipole on another, with the feedpoints actually inside the first floor window and the ends made off wherever possible. The possibility of putting up a temporary aerial with a G-whip worked against some radials may have to be considered if the big aerial isn't back up soon!

Last time round we mentioned the first few moves on the air of G4ITL (Harlow); since then Bernard has been having a quick look in the morning and another at lunchtime for DX and so far the ten-metre dipole has thrown its RF into various parts of W, East Coast and Central, VEs, and some necessarily-removed Europeans to get at the DX under them in Asia; VK has been heard at workable strength but the wolf-pack got on to him and Bernard gave that one a miss. However, so far nothing has been heard from Africa nor South America. But — we shall see by next time, as G4ITL has been seen with sidecutters and 60-watt soldering-iron, muttering dark threats about 'modifications'! There is no doubt about it, when G4ITL was a 'B' licencee, he didn't get half as much fun from his radio toys as he does now; even if he never uses Morse he reckons the sweat of learning it was worthwhile, although he has already indicated that some CW operation will come on to the menu ere long.

Conditions have been just about what one would expect at the peak of the sunspot cycle, although the HF bands have tended to close earlier. Twenty occasionally gave all the signs of closing only to re-open to W7-VE7 as late as 2300. On the lower bands, 7 MHz has been its own inscrutable self and happy hunting ground for some. Eighty is a band we don't hear much about in the DX sense apart from the many reports of the QRP chaps, while of course the Top Band

merchants do a very special thing which few of us understand, let alone practice. In the halcyon days when Top Band was the place for a natter, people would put out a CQ around 1825 KHz, listen round, and complain the band was flat the while they were blissfully unaware that down on 1803 KHz two or three DX stations were calling them. And, if you told them, they'd get annoyed and think it was a leg-pull in poor taste!

Top Band

Seeing that's the place we last mentioned, we should give it the first look over. From W1BB we have the story of KL7JEF, Mary, who has a 660-foot aerial, with the first 220 feet between 10 and 30 feet above ground and the other 440 feet lying on the ground. Let's give it a whirl, thinks Mary, and see if the FT-101 will perform. She puts out a CQ, the first on the band, no sked, no nothing, and to that CQ comes back 5W1BZ in Western Samoa! We have a nice photo too, and the *Call Book* tells us the young lady holds an Advanced-class ticket — none of your 'generals' or 'technicians' stuff here!

On the "domestic" Top Band front we have a report from G2HKU (Sheppey) who talked to HB9PR, HB9ADQ, and of course PA0PN, but used CW for his QSOs with UK2PCR, YU7BCD, K1PBW, UK2RDX, YU3EF, UP2PAP, DL1RK, UB5ES, UB5NAR and SP5IXI.

On another tack, although we have not heard of any Gs working them, Lloyd and Iris Colvin made 9000 contacts from J6LOO (St. Lucia) before moving on, and they reportedly managed to work all U.S. call areas on Top Band.

G3PKS (Wells) finds himself in the wars — Murphy is taking things too far this winter! The famous 'PKS 'pyramid' aerial, which manages to get about 400 feet of wire plus some traps into an area of 65×45 ft, was fetched by the gales round the 'PKS ears; then came problems with the horseless carriage, and to cap it all Jack himself has been a bit off-colour. Thus reduced activity on all bands,

and right down to nil on Top Band!

G2NJ (Peterborough) had a QSO with G2FAS on January 19 in which he mentioned that when the sun was right down on the horizon on January 10, several clustered sun spots could be seen, and in the middle of the disc a quite enormous spot. On that evening many observers noted fluttery signals on Top Band, sometimes so bad as to make it difficult even to copy call signs.

'CDXN' deadlines for the next three months—

April issue—March 6th

May issue—April 4th

June issue—May 1st

Please be sure to note these dates.

Eighty

Now here is a band which the writer could almost take pleasure in disregarding! However, as always, one mans meat is another's poison, and there can be no doubt that things are much better of late. Nonetheless, G2HKU gave the band a miss this time, but G3PKS had a few looks. In Jack's considered opinion the band was still suffering from the QSB during the midday hours, but much improved as compared with a couple of months ago.

G2NJ/M was in the back of the car with G3JKW/M at the wheel; 20 metres in the back, two metres in the front and a combined operation in a net of some six stations, including G3KPO, curator of the Wireless Museum at Arreton Manor; the QSL for this latter contact arrived at G2NJ the following morning! A nice way of passing the time between Peterborough and Sevenoaks and back.

Quite a while now since we heard from G3CED/G3VFA; George is testing out some new items, and as ever uses a couple of watts of CW. His operating pattern has been of weekends only (save for a few early

ones on the very morning of his letter). 3.5 MHz CW yielded him contacts with IN3NHZ, F8OQ, YU4EBL, F5IN, F3RM, OR5KH/OV, F9IQ, F5KQ, and G3URT — the latter gave a report of 339 and they had a twenty minute ragchew!

A nice long letter from G4BUE (Upper Beeding) reports on the QRP front, particularly the G-QRP Club Winter Sports which seems to have been generally enjoyed. To look at Chris's scores makes one realise just how much can be done. On QRP (defined as 5 watts or less) he worked 174 countries in 1979, and all CQ Zones, while at one watt or less there were some 111 countries; and if one talks in terms of QRP station to QRP station, then there were some 24 countries worked, and 78 members of the G-QRP Club.

Forty

Sadly neglected by many, but lots of interest under the QRM noises! G3KFE hasn't got an upright aerial for the band — it's lying on the lawn awaiting maintenance. So — listening on a ten-metre dipole has been about the score.

Your scribe has just been to the window to survey the "antennascape" only to observe that one end has fallen — and it's raining. Life's just not fair!

It was CW all the way with G2HKU, who used the mode on 7 MHz to work AI10 (what a call to be stuck with!), W4FGH, DJ3KP/KP4, K1AR.

Same again with G3CED and his prototype aerial system; he swapped level reports with F8LP who had 50 watts to a dipole while George had his faithful two watts (those batteries must be external ones!).

G3PKS found the band in pretty good shape by and large, working VE3GCS on Christmas morning and lots of inter-G working at 59 in most cases.

General

There is always a risk to someone who chases off into the wide blue yonder to give us all a new country, and it will be recalled that Jan Gould, WA6YQW, in doing just this was badly hurt. The damage was severe — broken back, broken legs, and other broken bones. She is to remain in Honolulu for some time in Ward 43,



Mary Salamanchuk, KL7JEF; see "Top Band". (Photo courtesy of W1BB)

Tripler Army Hospital, Honolulu HI 96859. We understand the job will be months of work and rehabilitation, and the *DX Bulletin* states that a fund has been set up to help in this process. The address for donations is "In Trust for Jan Gould Fund" c/o Norm Friedman, W6ORD, 5400 Lindley Avenue, Apt 312, Encino, California 91316, U.S.A. It is stressed that nothing in this fund will be used for the expenses of the trip. A letter to Jan, and a donation to the fund will be a couple of good things to be done, we feel.

Various people have mentioned a station signing ZA3KL, ZA3KS, or ZA3AK. The *DX Bulletin* reckons this just *might* be, perhaps more likely the Tirana Phoney. If you are thirsty for a ZA QSL, try shovelling one towards I8KZB (thanks to G2ADZ for the latter bit of data).

If you come across a station signing just 5AC then it is probably 9U5AC, especially if he shows on 20 or 15 which appear to be his favoured places.

We have it that there is the possibility of some amateur radio activity from mainland China in the first week of March by ZL1ADI and ZL1AMO; these two will be in China at the relevant time, and have hopes. From past experience "hope" is often a lying jade! But there is someone in there trying, which is the main thing.

28 MHz

Seems to be giving in a pretty fair

old way for G4ITL, as already recorded. So, let's see what the others have to say about it all.

G3NOF (Yeovil) comments on the winter conditions; there have been some long-path openings to VK/ZL/JA around 0900, while the short path opening ran from 1100 to 1500z and included VS6 on occasions. The North Americans were to be found at 1230 through till 1900. Thus Don made SSB QSOs with A4XGY, DL6VY/9Q5, J7DBB, KA7DQQ (Arizona!), OK3TAB/D2A, VK3LW, VK3VIV, VK4HNU, VK6NEP, VK6NHF, VK6NLF, VK7OC, VK8NNN, VS6AG, VS6EZ, VS6FI, VU2RAK, W7KZL (Arizona), W7PG (Arizona), W0YK, and W0ZV in the same State.

G4EAN (Nottingham) managed to get a little operating time in, but an explosion locally spattered the aerial and tower, so it will have to be grounded to check the state of the mechanism — brick-dust is death to crank-up tower cables. We might add that, in addition, it is rather surprising how spiky wire rope can become in a short time! Anyway, on Ten Ian reports contacts with K7ZFX, KA9AAB, VE3CVJ, VE3IHQ, VE3LCJ, ZP5AR; and a Gotaway in the shape of JW7FD who was on 28.572 MHz, 1100z, and asked for QSLs by way of LA5NM.

Ten for G2HKU meant CW with W0JL (Minnesota) VE2FRU, W6WU, W6VD, W60V, AG7S, VK2BPN, ZD8TC, VE5XU, and W6CG.

G2ADZ (Chessington) will be somewhat less active than of yore; his

XYL has passed on and he now has two young children to bring up, plus all the other chores. Bill will cope, of that G3KFE is sure, but we also know from personal experience just how hard it can be. Our sympathies are with you, OM. Nonetheless, Bill hooked 9Y4FT, TG0AA, XZ2AD, who sounded genuine and gave a QSL address via K3EST, VK7MC, J6LOO in St. Lucia, AF9X/MM1 (with the beam giving best results at a SW heading although the station was in the Mediterranean), UA0YAW for CQ Zone 23, HK3QO, VU2BK, CP8DK, and VS6F1.

G3PKS reckons the band is perking up a bit, at least at the times when he was on; he worked UO5ODT, W7AYY, W0TQW, KA8BHM, and W3KTW.

The QRP of G3CED and his new experimental aerial arrangement made it to OH5TY, OH3AA, RZ3AC1, YU1DZ, UR2REK and all with R579 or better, using two watts.

G4FAM (Beckenham) has some 151 countries on Ten; he uses 132 feet of end-fed wire to an FT-101B, the wire being some 17 feet up. G4FAM promised himself a beam when he reached 200 countries, but has gone to 236C and now decided he likes doing it the hard way!

QRP from G4BUE on Ten has managed W60V, N6FX, and W6VD with the five watts and CW.

Fifteen

A nice band, this. Lloyd and Iris Colvin moved from J6LOO as already related, and now we hear that G2BJY worked them from J7DBB, as also did G3NOF. No doubt about it, these two certainly like the DX end of the QSOs and know how to do it as well.

G3PKS has been meditating on what to do with his skywires so hasn't done as much operating as usual; but some good ones included W3AJH, WA6CLK, CT4DX, and UA0AJ.

For G3NOF, the 21 MHz summary could be described as much like 28 MHz. SSB was the mode used to work to A4X1A, J7DBB, JA6FBA, JR6PJR, UL1A, VQ9DM, VU2TF, WA0UFS (South Dakota), WB0YVY (North Dakota) 5B4HF and 5T5CM/2.

G2NJ mentions that his good friend G5NX (Winderemere) managed a QSO with JA3WIO/MM aboard the Saiko Maru in the Red Sea, at 24°10' S, 21°35' E. Another with only one

contact to report is G4EAN, who got across to WB3KNS.

During the G-QRP Club winter sports, G4BUE had quite a good time on various bands, with perhaps the best QSO the one with WIRM completed with only 18 milliwatts of RF output.

Award

In the post along with his reminder of the Easter Activity Week aboard *HMS Belfast*, came another note which indicated that the cost of the Mercury Award will have to go up to 50p or 6 IRCs as from April 1. Details of the award from the Hon Sec, RNARS, *HMS Mercury*, East Meon, Petersfield, Hants.

Twenty

This is where it all happens, they say. However, since the Afghan crisis started the 'woodpecker' has been running more or less continuously; doubtless in anticipation of a retaliatory strike by the West.

G3PKS visited a couple of times, obtaining reports from UL7PDC and SM7ITN.

G3CED/G3VFA had three QSOs with his two watts, and one of those, UK2GKN, was given a handsome report — RST 586. We hope he got the message!

G3NOF finds the band opening at about dawn to VK/ZL/JA on the long path turning round to short path around noon. N. America started to show around noon, with the West Coast about 1600-1900 then band closure about 2100, sometimes opening again as late as 2300 to the West Coast. Don didn't make many QSOs himself though, with just KP2A, VE6CU, and VE7XM.

G2HKU says he's been a bit off-colour, but the bands haven't. His SSB ZL skeds continue, with ZL1VN, ZL3SE, ZL3FV, and ZL3RS, while CW accounted for JE1HYR, W5ADZ, JA5TX, PY7DX, W5XJ, LA5HE/W6, and KV4AA.

G4FAM says that G3KMA has got some super totals for the six-band tables, and G4FAM himself seems to have been trying pretty hard. He brings up a point in this context which is the one of "do we make the table on the current 'possible' or do we discuss it in terms of an All-Time Post War list." Personally the writer feels that the rules should encompass the current

countries accepted for DXCC, e.g. removing those countries which have been included as countries and then again after independence under their new name and Prefix.

G4BUE found the AGCW-DL Winter QRP Contest was a bit of a personal disappointment; having decided that it was going to be a 21 MHz entry, Chris then found he was going to have to be at work three hours before the end of the contest, which caused him to change to 14 MHz, on which he got in a total of 12½ hours out of the allowable fifteen (the remaining hours being lost owing to the band closing). The result was a disappointing 87 QSOs in 29 countries, including UG6, VE1, VE3, EA9, W2, W4, W9, and KV4, with a power input of 3.4 watts to make a Class A entry and claimed score of 7137.

Finale

It is always nice to come to the end of the month's pile of mail for *CDXN*; but we would still like to hear from plenty more of you, with your doings and table entries. In the context of the latter we are ready to accept two entries from a station; one at the normal power level, and the other for countries worked on the QRP level. For the purpose of this exercise we will define QRP as a station with less than five watts input, or three watts output measured. The latter will enable people who want to run QRP with the big rig to do so, though at a fantastic waste of power. However, we must say to such people that the whole contact must be on QRP to count — any idiot can work a country with all the stops out and then ask the guy to listen for the signal as the wick is turned down, and swap reports again.

So — there it is again; The deadline date is in the 'box', and we should like to hear from you all — remember that everyone's first contact is (usually) with Joe down the road, and that is real DX until in the fullness of time one can build up a total. Address your letters, reminiscences, table entries, comments on band conditions and so forth, to "CDXN", *SHORT WAVE MAGAZINE*, 34 High Street, Welwyn, Herts. AL6 9EQ.

THE RABBIT PATCH, PART II

CAPACITY SUBSTITUTION BOX

BY "BUCK"

"New Readers Start Here"

Having decided to build a Short-Wave Communications Receiver on a teach-yourself-as-you-build-it-yourself basis the first project was a Decade Resistance Box, which gave me one piece of equipment to help me on my way. Well — one and a half pieces if you count the crude 'continuity tester' made from a torch battery, a bulb and some wire. Not much, perhaps, but a beginning. The interesting question was — what ought to be built next?

To find the answer I turned to the seven guidelines I'd worked out when I first started (*Part I*, "Short Wave Magazine", December 1979). Putting 2, 3, 4, 5 and 7 together led to the conclusion that the next item ought to be a Capacity Substitution Box. The arguments that applied to resistors concerning the need to have dependable values of components readily to hand apply also to capacitors.

Description

"A Capacity for day-dreaming is no substitute for the Capacity for achievement"

Anon

A home-made box, two rotary switches, a slide switch, twenty-four capacitors of differing values, two terminal posts and some single-stranded PVC covered connecting wire are the essentials.

The box at 7in. × 5in. × 2½in. (178 × 127 × 63mm.), can be larger, but shouldn't be smaller. If a ready-made case is available, then use that; but metal casings are not to be recommended for this particular project because of the possibility of thereby introducing capacitance variation problems.

The slide switch allows a 'picofarad' range of values or a 'nanofarad' range of values to be selected. (This nomenclature is, of course, purely a matter of convenience: C.11 at 1,000 picofarads is only another way of saying "one nanofarad", whilst C.12 at 1,500 picofarads is only 1.5 nanofarads in disguise.) However, unlike the cascade-type construction of the Resistance Box, only one value of capacitance can be selected at a time and presented to the output terminals.

The terminal posts are the kind that accept a 4mm. plug, or a spade terminal, or a bare wire; a flexibility of coupling arrangement that is valuable when the box is in use. It goes without saying (which is why I'm busy saying it) that the builder can use anything that comes to hand for this purpose — provided that the end result is acceptable to him.

Materials

For the case, another visit to the supermarket for a tomato box with a hardboard bottom, and a discarded fruit or vegetable crate will provide all the materials needed, and more besides.

When it comes to choosing the capacitors to be used, the builder has to make his own value judgment. The tighter the tolerance of the components selected the more accurate the standard will be when completed, the greater the stability of the components when used in certain functions — and the more the project will cost. Not that this choice involves much — only about £1 or £1.50 difference exists between the highest and the lowest cost. But the builder must establish for himself whether the additional cost is *really* justified because, although this is a simple case, the principles of selection involved will apply with ever-increasing impact to each successive project. A happy-go-lucky approach now can lead to habits being acquired that can cost many unnecessary pounds in the future.

The type of capacitor also plays a part in deciding what to use. Electrolytic and Tantalum Bead varieties can be ignored for present purposes. For the rest, the choice lies between:

- (a) *Ceramic*: Fairly low values; reasonable tolerance; can be used in tuned circuits.
- (b) *Paper*: Fair range of values; tolerances similar to ceramic; high insulation resistance; suitable for mains power supplies and audio frequency work.
- (c) *Polyester*: Values range from 0.01 microfarads to 1.0 microfarad; tolerances similar to ceramic and paper; suitable for audio frequency work.
- (d) *Polycarbonate*: The same as polyester but with a higher upper value limit; low self-inductance.
- (e) *Polystyrene*: A good range of low values; good tolerance; good stability; low self-inductance; suitable for radio frequency tuned circuits.
- (f) *Silvered Mica*: As for polystyrene; tolerances very good (plus-or-minus 1%, or less).
- (g) *Ceramic Plate*: A good range of low values; fair tolerance; small in physical size; used in tuned circuits.

For the job in hand the choice lies between (e), (f) and (g); silvered mica being most expensive, polystyrene the next dearest, and ceramic plate the cheapest.

Cost

Polystyrene and ceramic plate capacitors were chosen for the project because the tolerances obtained were quite good enough for the job they would have to do. Also, the RC(L) Bridge (to be described later) would enable an accurate measurement of each value to be made. If required, a new legend showing the amended values could be made and fixed on the front panel. With the capacitors chosen, the cost of the Substitution Box came to £3.50 at June, 1979, prices. There are few commercial units on general offer, but one kit is available for an 18-capacitor box priced at £14.49, which gives something of a comparison.

Construction

The safest course to follow in building this unit is to obtain all the components and then to consider the constructional details with the bits in front of you. Have a good look at the way the capacitors are mounted to fit between each block and the appropriate switch. You may wish to alter a dimension here or there so that the finished article is more to your liking; or permits a method of construction with which you feel happier. Whatever it is that you wish to alter, go ahead. There is no need to follow any of these

details slavishly; each project is your thing and should be done your way. Should the altered results fail to come up to your expectations you can always fall back on the details given below, and no harm done.

Make the box as the Resistance Box (*Part I*) was made, i.e. join the long sides to the short ends, glue and pin. Glue and pin the back panel onto the wooden framework; screw the front panel on while the shaping process is done by rasp or *Surform* or whatever, rounding-off the corners and making the edges flush. When the shaping is finished take the front panel off; paint or stain the box and put on one side; stain or paint, mark out and drill the front panel to the dimensions shown in Fig. 1. Inscribe the legend as shown, either directly onto the front panel or onto thick paper (or thin card), which can be glued into place.

The next step is to mount the slide switch, the two terminal posts, and the two rotary switches. In Fig. 2 the rotary switches (S1 and S2) are shown mounted with a 180° difference in contact positions: this has been done to highlight the point that the builder must pay particular attention to the type(s) of rotary switch with which he is working. The switches may be the kind that can be rotated without coming up against a stop; or, they may have to be turned back from position 12 to get back to position 1. In either case the spindle may be fully round or flatted on one side. A further complication can arise if the spindle is fully round, but the accepting bush in the pointer knob has been made to accept a flatted spindle. Should this be your fate you have the option of drilling out the bush, or filing a flat onto the spindle. The reverse situation (a flatted spindle and a circular bush) presents no problems; unless you happen to have mounted the switch in such a way that it becomes essential for the grub screw in the knob to bear on the flatted part of the spindle — which it just might be too short to do!

Take no chances. Give thought to the positioning of S1 and S2 according to the components you have, and so arrange the mounting that the lowest value of each range of capacitors is selected when the knob is in the '7 o'clock' position when viewed from the front. The locating-pin hole should then be drilled as and where it needs to be. Don't forget to remove the position limiting collar if there is one, otherwise you will have something less than 12 positions to select.

While the switches are still free, check their continuity. Each position of the switch should make contact with one tag and one tag only. Check the continuity of the slide switch (S3) between the centre tag and each end. Make sure that contact is positively broken from the tag at one end when the slide is moved to the opposite end. Check the continuity of the terminal posts too; far better to be sure, rather than sorry.

Next take the three blocks of stripwood and knock a coppered panel pin into each of a 1/2 in. (12mm.) face. When stuck in position with impact adhesive the height of each block, 3/8 in. (16mm.), should roughly equal the height of the S1 and S2 switch bodies from the panel face up to the bottom of the switch tags. Strip the insulation from three 60mm. lengths of connecting wire and solder one length between each pair of pins to make a bare connecting rail on each block. Position the blocks so that the capacitors will fit neatly into the gap between the connecting rail and the appropriate switch tags, and glue into place. Follow the wiring diagram in Fig. 2, and using insulated connecting wire join the upper pins of Blocks 1, 2 and 3 together, and the upper pin of Block 2 to one of the terminal posts. Connect the other terminal post to tag 2 of the slide switch (S3), and connect S3/tag 1 to S2/tag 13, and S3/tag 3 to S1/tag 13. Check all the wiring for continuity in case a dry joint has slipped itself in unnoticed.

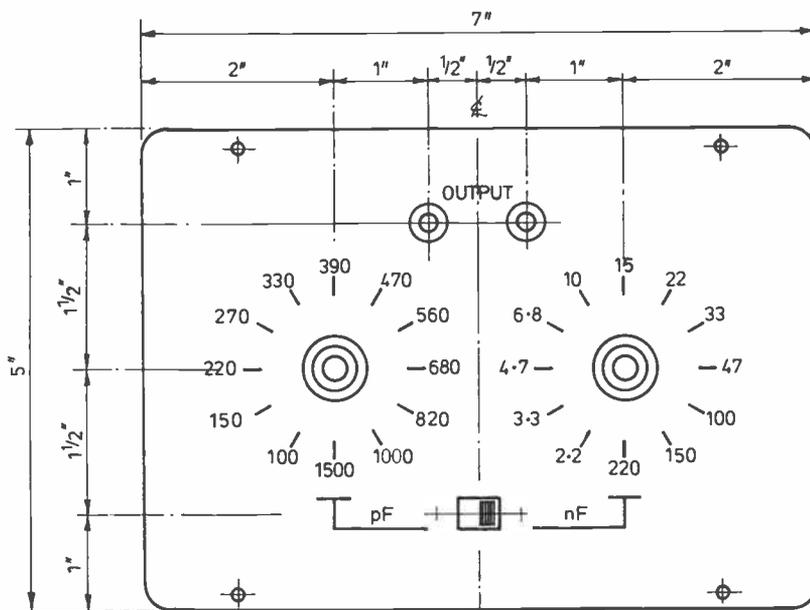
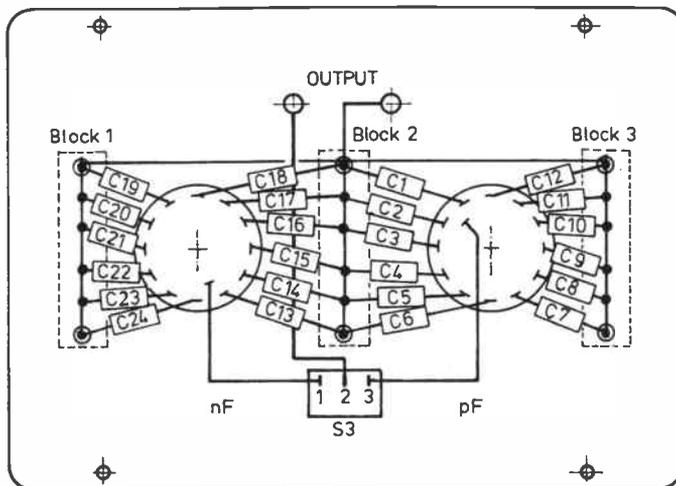


Fig. 1 FRONT VIEW OF CAPACITY BOX (Knobs omitted for clarity).



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Fig. 2 REAR VIEW OF FRONT PANEL

The only things left to fix are the capacitors. Check them for continuity. They should show 'open circuit' (o/c) and the bulb should not light. As remarked before, values can only be checked by an RC(L) Bridge; but whether each component is functioning as a capacitor can be determined by a special tester to be constructed after this unit is finished. Don't depend upon the reasoning that because the capacitors are new they must be in 100% working order. (In my own case, C8 (560 pF) had an intermittent short-circuit; sometimes it worked well, and sometimes it was a direct short). Incorporated into a circuit a component can be

checked a dozen times without revealing that it has the ability to act the traitor. Bearing in mind that the wiring is being done behind the front panel so that the nanofarad range will now be on the left-hand side and the picofarad range will be on the right-hand side, solder in the capacitors with the lowest value of each range connected to tag 1 of the appropriate switch and with the other values following in order.

When the last of the capacitors has been fixed in position, use the 'continuity tester' to put each spindle in the tag 1 position and fasten the pointer knobs on. Screw the panel into place on its box and, if you have't already done so, put a coat of varnish over the front panel to protect the legend. Remember to run a test-piece if you are using a combination of ink/paper/varnish that you haven't used before — just in case!

Table of Values

C1 = 100 pf	C13 = 2.2 nF
C2 = 150 pf	C14 = 3.3 nF
C3 = 220 pf	C15 = 4.7 nF
C4 = 270 pf	C16 = 6.8 nF
C5 = 330 pf	C17 = 10 nF
C6 = 390 pf	C18 = 15 nF
C7 = 470 pf	C19 = 22 nF
C8 = 560 pf	C20 = 33 nF
C9 = 680 pf	C21 = 47 nF
C10 = 820 pf	C22 = 100 nF
C11 = 1000 pf	C23 = 150 nF
C12 = 1500 pf	C24 = 220 nF

Note: C1 to C19, 500v. DC working; C20 to C24, 630v. DC working; C1 to C18 are polystyrene or equiv; C19 to C24 are ceramic plate or equiv.

Also required: two single-pole, 12-way rotary switches; one single-pole double-throw slide switch; two pointer knobs; two terminal posts (black).

Case: two hardboard panels 1/2 x 7 x 5"; two timber sides 1/2 x 7 x 2 1/2"; two timber ends 1/2 x 4 1/2 x 2 1/2"; three wooden blocks 1/2 x 1 1/2 x 2".

Background Reading

Information will be found in various catalogues, as well as in standard technical publications. Look out for details concerning:

- (a) Fixed capacitors; their types, ratings and uses.
- (b) Any system of preferred values, similar to that used for resistors.
- (c) Colour codings in use; what types use which coding?
- (d) Variable capacitors; their types and uses.
- (e) The method of determining the total effective value of capacitors in series and in parallel.

Finally, purely for your own amazement, find out the difference between a 'padder' and a 'trimmer'. (N.B. Answers incindicating that one is a pussy-cat and the other is a fireman on an oil-burning ocean liner have missed the point somewhere or other).

to be continued

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SHORT WAVE LISTENER FEATURE

By Justin Cooper

ONE of the interesting facets of amateur radio is the RAE itself, with the eternal controversy over the use of a format of ten questions of which so many are to be attempted, and the other method of "multiple choice" questions. Listening around Eighty, the pundits would have us believe that the new multiple-choice RAE resulted in an enormous jump in the proportion of passes. As usual, the know-alls have it wrong! It is true that the number of *candidates* has jumped, which was something to be expected at least for the 1979 paper (insofar as those people who felt unable to cope with the old format would be expected to have a stab at putting ticks in boxes). That being said, what matters is the proportion of passes to failures in each year, and it is interesting to note that this year's pass percentage comes out very close to the average of the two previous year's passes. In other words, the change of method *and* syllabus in 1979 hasn't made any significant difference to the pass/fail rate.

This is an interesting statistic; and it means, we suspect, that the same people would have failed whichever method of examination was used, and for the same reasons. In essence these are inadequate preparation and examination 'nerves'.

What can one do about it? Well, inadequate preparation is easily enough remedied — not for nothing is it said that you "read" a subject at university: the emphasis is on learning rather than sitting back and "being taught". In addition, you can with a syllabus in front of you mark your textbook *clearly* with the parts which you *don't* need to learn. You have in one move taken away more than half the words, just by doing this. As experience is gained and you can get to be able to talk to people who have taken the exam, you will be able to get a "feel" for the bits which are in the syllabus but only rarely crop up in the exam. These you will study as carefully as all the rest, but your revision in the last run-up can leave them in favour of intensive revision of the parts you know to be likely questions on which you, as an individual, are weak. That means in simple terms, "don't kid yourselves!"

This leaves us with the trickier 'nerves' problem to which, if you are a bad sufferer, there are no cut-and-dried easy answers. A useful approach can be to ask yourself what you are *really* frightened of, remembering that the exam is just a means by which some pretty basic fears are aroused — whatever they may be in each individual case. After all, no exam in *itself* is actually able to *terrify* anybody! The more honest the answers are that you come up with (that's the difficult bit!), the less the exam will seem like a ghastly monster.

The Mail

And we'll look first at the new chums; top of the pile is a fat list of some 535 claimed by RNARS member 1415 — he didn't sign his name, and so we can't enter him in the lists; but we may be able to manage something if we can latch on to Hon Sec RNARS and get him to supply the data. If not — hard luck!

H. Scott (Wetherby) has taken all the year to collect a nice list; as he says, about 1% of the calls heard are new prefixes, so he reckons he will have to experiment with aerials to bring up the score. We would suggest a better method would be to stick with the same aerial but try different *times* and different bands, the latter being quite useful if an end-fed aerial is in use; with a 66 or 132-foot end-fed Zepp and a tuner, on different bands it will be found to "look at" different parts of the world, which is useful.

Returning to our anonymous friend of a few lines back, G3LIK of RNARS tells us he is *M. Mullins (Croydon)*; and in the latest mail incoming, there is an up-date which again doesn't mention his name! Next time, *please* announce yourself!

Our next entrant is hardly a new chum insofar as he used to write in 'way back in 1968 as a schoolboy; now *P. Fry (Timsbury)* is the village bobby. To clarify points regarding our Ladders, the annual ladder requires 200 prefixes to be heard for a start to be possible; during that year you may continue accumulating until you reach 500, when you are transferred to the All-Time. On the other hand, if you reach the end of the year and still haven't found your 500, then for the following year you have to start all over again. The idea of this was to keep the new chums all together and competing against each other on a level basis until they know the ropes: by a score of 500 this knowledge is, we feel, gained and so the All-Time is the old hands versus the other old hands. As for the CW, the start is at 200 to encourage more entires, on the assumption that the basic arts of SWL are already learned before one tries for CW at all.

Another point comes up from *D. J. Wiltans* who has his receiver at home in *Wednesbury*, his time largely being spent at Reading University — wise chap to leave the receiver behind! His point concerns prefixes heard in 1979 which don't appear in his 1980 list when he reaches 500 and goes into the All-Time. Clearly enough these are good for additions to the All-Time, and indeed most people concerned mention them in the letter which comes with the list that takes them over the top.

Our next entry comes from *Mrs. R. Smith (Nuneaton)* who has an AR88D while son G8ERM is working in the Persian Gulf area. Having got so far with it all, Ruth is wondering whether or not to have a stab at the RAE and get a call of her own — why on earth not?

Nice to hear again from *H. M. Graham* who is now in his new place in *Newmarket* and listening again, mainly on Ten, and apart from a fair lift in the Ladder score he has managed a couple of new All Time Countries, still using the Joystick and ATU to either the SSR-1 or the FR-50B.

Next we have *T. Grimbleby (Hull)* who managed to find the old logs he made prior to his lay-off, and so has quite a bit of a lift in his score. On a different tack, he wants to know what are the advantages of a receiver band-pass filter, and what it is. A Good Question. If one is talking about a device to put at the front-end of a receiver, then it is a sharp filter which is all but loss-less across the band and then falls

HPX LADDER

(All-Time Post War)

SWL	PREFIXES	SWL	PREFIXES
	<i>PHONE ONLY</i>		<i>PHONE ONLY</i>
K. Kyezor (Brandon)	2267	P. Ford (Longlevens, Glos)	734
B. Hughes (Worcester)	2028	M. Mullins (Croydon)	732
S. Foster (Lincoln)	1871	R. Middleton	
J. Fitzgerald (Gt. Missenden)	1655	(Bury St. Edmunds)	731
E. W. Robinson		D. C. Casson (Reading)	709
(Bury St. Edmunds)	1600	D. G. Sim (Southampton)	677
M. C. P. Bennett (Datchet)	1455	J. Doughty (Birmingham)	614
M. J. Quintin (Wotton-u-Edge)	1454	G. F. Green (Middlesbrough)	563
H. A. Londesborough		B. Shepherd (Staines)	563
(Swanland)	1406	Mrs. R. Smith (Nuneaton)	552
H. M. Graham (Newmarket)	1215	T. Anderson (Stroud)	540
M. Rodgers (Harwood)	1147	L. Joyce (Grimsby)	541
M. Ribton (Oxted)	1071	F. C. D. Barnes (Cardiff)	521
M. Law (Chesterfield)	1059	B. L. Henderson (Chetnole)	501
P. L. Shakespeare (Foulness)	1025		
M. Shaw (Huddersfield)	1006	<i>CW ONLY</i>	
D. Taylor (Harborne)	962	H. A. Londesborough	
(Swanland)			1180
J. Nicol (South Croxton)	916	D. W. Waddell (Herne Bay)	1024
K. Linge (Willington)	867	P. L. Shakespeare (Foulness)	775
D. Hill (Crawley)	800	T. Grimbleby (Hull)	634
L. Stockwell (Grays)	794	D. L. Hill (Crawley)	376
A. Twelves (Rhos-on-Sea)	751		

Minimum score for an entry: 500 for Phone, 200 for CW. Listings include only recent claims, and are in accordance with HPX Rules (see p. 615, January 1980 "SWL"). A 'Nil' return is allowable in order to hold a place.

steeply on either side. This means that signals outside the band are attenuated and hopefully will no longer be able to upset the receiver front-end. The point here is that if just one signal is able to drive the RF stage or mixer out of linearity, all the others are affected and mix with each other and the receiver local oscillator, resulting in an artificially high noise level. The receiver front-end is quite broadly tuned, being damped by the low impedance offered to it by the aerial, so that signals which in theory can't be in the receiver coverage are able to cause the fault. The choice is either a band-pass filter just covering the band, or an attenuator which reduces the receiver RF signal until the non-linearity goes away and all the signals become audible above the noise again. The technique is much used in secondary radar receivers both ground and air. One transmits on 1030 MHz and receives on 1090 MHz, and the other sends on 1090 MHz and receives on 1030 MHz. The ground station "interrogates" by sending a string of pulses out at regular intervals while the aerial rotates, and the receiver in the aircraft, when it receives an interrogation, sends out a series of pulses in return which provide identification and other data as required. Old hands will recognise this as the modern development of what used to be called "Indicator Friend or Foe", or IFF for short. Both ground and air receivers are fitted with a bandpass filter ahead of the receiver proper to ensure they do not block in the presence of out-of-band signals of strength. This is very necessary as an SSR ground receiver, for example, will have instead of AGC an arrangement that gradually increases the gain of the receiver with time after an interrogation until the designed maximum range. It will then go back to the low-gain state while the next interrogation goes out and the cycle repeats. The idea is simply that the ground station can't be surprised by a nearby aircraft which has just thought to switch on his transponder. Finally, SWL Grimbleby mentions the Y calls now being used by the East Germans (not the YUs), and the R calls from Russia for the Olympics. Russia has in any case used R for their VHF-only call signs.

B. Shepherd (Staines) introduced a friend to his hobby, and said friend is now studying hard for the RAE. From this friend comes a list of the U.K. Coast stations heard on Top Band, and their various calling, distress and working channels. The spread is such that any small boat must have quite a problem with obtaining an efficient aerial: on the coast station answers initially on 1792 KHz and then may shift up to 2670 KHz, while the ship may call on 2182 and have to move up as far as 3252 KHz! Anyone with a mobile whip on Top Band will know what a problem is presented.

A nice long letter from *R. Barker (Workshop)* who mentions P8K on 3650 KHz who transmits, between 2000 and 2200, a steady 15 w.p.m. of five-letter cipher groups. With its aid Ron is now plucking up the courage to fill in the application form for a test! On a different tack, Ron was in Canada and the States on business in September and was amazed at the number of towers with beams and quads atop them all, commenting that they must have a different "planning permission" approach than here.

J. Doughty (Great Barr) confesses that paperwork is not his strong point and notes that his new revised list still has the odd omission. We know the feeling exactly!

Back in November we mentioned a letter from S. R. Potts of Dunoon about an FRG-7 owners' club. Mr S. F. *Whetstone* wrote in response and his letter, to his surprise, was returned marked "gone away". If there are any FRG-7 owners who are interested in forming a club, perhaps they would write to Mr Whetstone, 2 West View Cottages, *Lindfield*, Sussex RH10 2LJ.

Next we have *D. G. Sim*, who has a new, but temporary, flat in *Southampton*, and is therefore feeding his FR-50B through a G-Whip Tribander. This is a good scheme in fact, particularly if you arrange three "counterpoises" one for each band, under the carpet. To judge by the list in the letter, it works well enough, with some representation from all continents.

S. Foster (Metheringham) had a field-day with the new prefixes from Russia and East Germany, not to mention a couple of all-time new countries in the form of ZK2VE and C21AM, to make 319 heard, 315 confirmed. The biggest "wants" lie in BY and XZ, and it does look as though the former, at least, is coming along.

J. Parsons (Newton Abbot) comes down one by virtue of a little mishap — he put two UK2 stations in the list! For the rest, quite an interesting collection for a first list. He queries the EF4CIN International Childrens Congress heard on October 26th, first on 14180 and then again on 21275 KHz. John's other query is whether, if and when he starts his 1980 list, he can claim the same prefixes. Yes, of course, with the proviso that once you come to 500 you go into the All Time list, and the combined lists will need to be pruned. In other words HZ1TA in 1979 is good for the 1979 table, HZ1AB is good for the 1980, but once the 500 has been reached one must go in the pruning, as only one HZ1 will then be acceptable.

E. W. Robinson's 52nd list from *Bury St. Edmunds* has no surprises — he knows the game too well for that — but it is interesting to note that he got to 1600-up a little earlier than he had expected by way of some prefixes on two metres.

A graphic description of his (successful) attempt to reach the 500 by the end of the year comes from *F. C. D. Barnes (Cardiff)*; he reckons he would have passed over an S.O.S.

ANNUAL HPX LADDER

Starting Date, January 1, 1979

SWL	PREFIXES
S. B. Harris (Coventry)	477
J. F. Hobson (Ely)	459
C. Stevens (Spondon)	408
T. Morgan (Swansea)	363
P. L. Spindler (Bradford)	344
P. G. Fry (Timsbury)	277
C. J. Parsons (Newton Abbot)	246
M. Pilsbury (Leyton)	241
Miss J. Ribton (Oxted)	216
B. P. Collinge (Enugu, Nigeria)	212

This is the final showing of the 1979 Table. The next "SWL" will contain a new Table, starting date January 1, 1980. As normal, on reaching a score of 500, transfer to the All-Time Post War Table is automatic. Rules in January *Short Wave Magazine*, p. 615.

if it had been from a prefix already logged! One of the interesting stations was that of JY1: an Italian station, having confirmed the two-way reports had the cheek to request His Majesty to move up 3 KHz and join the Pacific net. However JY1 did move up, and the Pacific net promptly gave the Italians who had been piling up on JY1 a lesson in good manners and courtesy — good for them, too. A bit of comic relief was provided by a group of Ws holding a frequency down for TZ4AQS on 14 MHz while the lad was only equipped for 21 MHz! Nothing to beat a good bit of optimism! Of the four queries, all are suffixes generated by being out /P. W5JMM/SU counts for SU5, WA1APS/P/DU2 is good for a DU2, G2ACK/VP2M is VP2, and G3XHK/PA counts as a PA3. The rules on this business are quite arbitrary and were thought up long ago to cover the situation as it then was.

Correcting an error in his earlier list drops *P. Ford (Longlevens)* by one but another 80 rather overshadows it! Phil heard many AEM calls in December and wonders what they are; not amateurs as such, for sure, but maybe MARS stations, operated by amateur licencees.

K. Kyezor (Brandon) seems to have found himself a good pirate, in the shape of ZA3SL, very efficiently coping with the pile-up of "work him first, worry later" types.

A new use for an old TV aerial in the life of *D. Casson (Earley)* is made by turning it into a ten-metre aerial, in which capacity it seems to have been quite successful.

L. Stockwell (Grays) still sticks to his RAE 'last', at the time when the numbers start to decline, but he is a bit surprised that no-one else is on the ladder in his class — the writer would bet that a census of the chaps on the RAE course would show most of them haven't even got a receiver yet!

Others

This is the place where we acknowledge the scores of: *M. Ribton (Oxted)*; *M. Shaw (Huddersfield)*; *M. Law (Chesterfield)*; *R. Middleton (Bury St. Edmunds)*; *H. A. Londesborough (Swanland)*; the last-mentioned for both SSB and CW lists. All are being taken in to the Ladders as appropriate.

Finale

Deadlines for the next two "SWL" pieces are March 20, and May 22, addressed as ever to Justin Cooper, "SWL", SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ. *Au 'voir!*

A NO-COST VERTICAL YAGI FOR "SEVENTY"

ANTENNA PRACTICALITIES AND PROBLEMS AT UHF

JACK HUM, G5UM

TWENTY-five years ago (give or take a year or two) G5UM contributed an article to this magazine under the headline "Yagi Made Easy". The impact resulting from it in the way of comment and correspondence was second only to that which resulted from an earlier article "An All-EF50 TRF Receiver", which, much to the writer's embarrassment, was widely reproduced in the amateur radio journals and news-sheets of many countries, either with or without the permission of SHORT WAVE MAGAZINE. (If nothing else, that particular article demonstrated the widespread distribution of that ubiquitous war-surplus valve the EF50 to some of the most unlikely spots on the Earth's surface).

Although "Yagi Made Easy" did not generate quite this order of spin-off, it clearly met the need of the increasing number of transmitting amateurs (and indeed receiving ones as well) who were beginning to accept the challenge of the then new and comparatively untried metre-wave spectrum. Parenthetically, one might venture the thought that much of the big switch to VHF in the Nineteen Fifties came about through a disenchantment with the HF spectrum and its failure to provide little more than rubber-stamp QSOs and country collecting.

Since those days — in fact within the last half dozen years — the 2m. and 70cm. bands have developed in a manner which would have startled the early metre-wave pioneers: these bands have exhibited if not a condition of parthenogenesis then certainly one of fissiparity. In simple words, they have split into two, the lower end of each band becoming (broadly) the DX end and the top half (broadly) the "local" end. And along with this change has come a polarization of (broadly) horizontal aerials for the lower end and vertical ones for the upper half.

Because this movement has been accompanied by an acceptance by operators, in the 145-and-up area, of aerials of dubious quality and design and of no directivity at all, many a newcomer to 2m. tends to remain quite content with the restricted local contacts which such antennas provide. Perhaps as dissatisfaction dawns, better aerials for "Two", at least at fixed stations, will come to be used in the FM segment.

Now, as "the next band up" earns increasing occupancy it is to be hoped that the shortcomings which have happened on "Two" will not be repeated on "Seventy". There is one reason in particular to hope that past errors will not be perpetuated, namely, that directional aerials for 70cm. are easier to construct than those for 2m., and by taking up much less space are that much less prominent in the eyes of the non-cognoscenti — no bad thing where planning permissions loom.

At this point one must reiterate that these references are to vertical aerials for that "local" area of the 70cm. band above 433 MHz. For the DX area at the bottom, admirable ranges of high gain aerials (which are normally erected in the horizontal plane) are available from advertisers in this journal. One must also emphasize that the present treatment deals with home base arrays: mobile men are perforce and inevitably stuck with stacks.

The present problem is to discuss how best to go about the provision of a simple directive array for use in the local FM area of 70cm., and at all costs to head off the 2m. mentality that "anything goes": on 70cm. it doesn't.

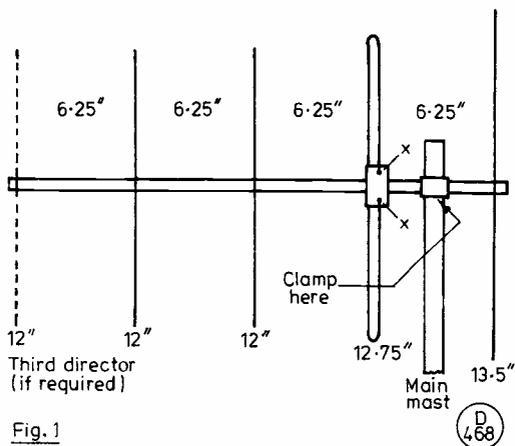


Fig. 1

This simple design for a 433 MHz Yagi aerial may be constructed from metal work recovered from redundant television aerials. Materials: main boom $\frac{1}{2}$ in. or 1 in. dural, elements $\frac{1}{4}$ in. metal rod, dimensions as shown. The rods are secured to the main boom with 4BA nuts and bolts and shakeproof washers. The folded-dipole "trombone" section terminates on a perspex or polythene block bolted to the main boom, and the 75-ohm feeder is connected at its open ends at Point "X". Once constructed, the design is virtually self-matching.

For one thing, the capture area of a 70cm. dipole is roughly three times down on a 2m. one (using that empirical rule of thumb rating that 70cm. is three times as difficult as 2m. — and maybe three times as interesting). You need only look at a 70cm. dipole to recognize its inadequacy: it is just a foot long! Go ahead and stack a few of them vertically and an antenna of sorts will result, bringing with it many of the mechanical problems which this approach at 2m. has thrown up, and of course devoid of directivity.

When the difficulties of building and correctly matching stacked dipoles under amateur conditions (often with rudimentary test gear) are considered one can only regard as heroic (or foolish) those who attempt them.

And so back to "Yagi Made Easy". The original article a quarter of a century ago gave a mnemonic for easy recall of the dimensions of a 2m. design: they were 36, 38 and 40 inches for director, driven element and reflector. Space them all 19 inches apart along a metal boom, fashion the radiating element into a "trombone section" fed in its centre by 75-ohm coaxial cable, and *hey presto* the whole thing is self-matching and capable of giving very encouraging results.

If now the dimensions are scaled down by a factor of three then — equally *hey presto* — you have a 70cm. Yagi aerial likely to outperform any home-built stack that can be imagined. By possessing in-built directivity it will be found to bring up the signal level of 70cm. mobiles enormously, and will confer the further advantage of excluding those co-channel 70cm. repeaters which irritatingly pop up under lift conditions; indeed, for the amateur sited between two co-channel repeaters it will permit accessing of the wanted one and a nulling down, if not out, of the unwanted one.

Although the original "Yagi Made Easy" design postulated the use of three elements there is no reason why the 70cm. version should not go up to four or five elements. More than this is not to be recommended on aerials intended for the local FM end of the band: beam width narrows as more directors are added. The objective at 70cm. should be to construct an aerial with a reasonably broad forward field of coverage that enables a weak signal to be detected and brought up to maximum level by rotating the beam on to its source.

Having referred to the need to rotate the now newly-built Yagi on to the wanted signal one must admit that this requirement will be off-putting to the extent of persuading the less adventurous from having a go. This would be a pity: devising a suitable method of rotation is not difficult and may range from "the armstrong method", or perhaps an endless cord around the mast outside tugged from inside, through to the sophistication of an electrically driven system complete with plan position indicator.

In the writer's case a 3-element beam for 4m. driven by a Stolle rotator was already in service. The newly-built 70cm. Yagi clamped to a 4ft. aluminium tube was simply "plugged in" to the existing mast above the 4m. beam. The two now go round together.

Finally, what is the significance of those words "no cost" in the title? Simply this: that the tubing from which the 70cm. Yagi is to be built may be obtained almost literally for the asking from any of those many television dealers and aerial erectors who were left with tons of it when the great changeover from 405 to 625 line television rendered millions of Band 1 and Band 3 arrays redundant. Just one snag: the rush to build easy-made Yagis for 70cm. may not only cause scrap supplies to run out but may put a scarcity value on them so that they end up by costing good money!

And a final-final: two pieces of advice where construction of the aerial is concerned; slightly flatten the centre of each element in the vice before securing it to the main boom as this will facilitate drilling to accommodate the fixing bolts. And never forget after all the rods have been secured to glance along the length of the array to make sure they are all in alignment. Secondly, if you *do* build yourself a Yagi from clapped out old telly rods make sure you give them a good scrape and polish before fixing, especially in the vicinity of those sensitive contact areas. Remember that corrosion is a remarkably good insulator!

THE "S.C.D.", PART II

CONTINUING THE LOW COST, LOW TECHNOLOGY, QRP TRANSCEIVER PROJECT

REV. G. C. DOBBS, G3RJV

Receive Section and VFO Facility

In *Part I* a simple, easy to build VXO transmitter was described. This month the appropriate "kitchen table" technology construction is continued with the conversion of that transmitter into a complete transceiver, with the option of VFO control. Like the transmitter, the S.C.D. receive section could be built as a project in its own right; all that is required to make it into a complete receiver is a variable frequency oscillator on the required amateur bands.

The receive section of the S.C.D. uses direct-conversion techniques. A direct-conversion receiver could be called a mix between a conventional superheat receiver and a product detector used for CW or SSB reception: it mixes the incoming RF signal with an internally generated signal in a similar manner to the superheat, and then amplifies the difference between the two. Whereas in the superheat the resultant output is still at radio frequencies and called the intermediate frequency, or IF, in the direct-conversion receiver the resultant output is the required audio signal.

The difference between the incoming signal and the local oscillator is in the order of 1 KHz or less, so the result is at audio frequencies. The resultant beat note between the two signals makes the system only really suitable for CW or SSB reception, but this is ideal for our CW transceiver. The principle and the circuitry are so simple as to cause doubts amongst the sophisticates of the amateur radio world. The only possible defence is to ask the doubters to try the system: converts to the method claim, with justification, that a simple, but well made, direct-conversion receiver can hold its own with all but most expensive modern receivers.

A direct conversion receiver has few tuned circuits and most of the gain takes place at audio frequencies, making it ideal for home construction. These two factors, however, make it suspect, but they can be easily compensated for. Since most of the gain and selectivity take place at audio frequencies, it is usual to provide high audio gain for sensitivity and audio filtering for selectivity. The stability of the receiver is as good as the oscillator, but since in transceiver applications this is also the transmitter VFO, it is expected to be stable.

Circuit

The circuit of the receive section is shown in Figs. 1 and 3. The heart of the receiver is the dual-gate MOSFET TR1 which acts as the signal mixer; the mixer and audio pre-amplifier are contained on one board. A second small board contains an integrated circuit audio amplifier using the inexpensive, high gain, LM380N.

The input to the receive section is taken via the transmitter output broad-band pi-network filter (L3, C11, C12 of the transmitter circuit) which provides an additional front-end tuned circuit. This is coupled via Cx to a tuned input circuit L1/VC1; two diodes D1 and D2 provide simple transmit/receive facilities by blocking the excessive RF voltages present on transmit. The signal enters gate 2 of the dual gate MOSFET by way of C1.

Table of Values
Fig. 1

R1 = 47K	C4 = 0.01 μ F
R2 = 33K	C5, C7 = 0.22 μ F
R3 = 1K	C6 = 100 μ F elec.
R4, R7 = 4.7K	TR1 = 40673 (see text)
R5 = 220 ohms	TR2 = BC109
R6 = 1.2M	VC1 = 250 pF variable
C1, C8 = 100 pF	L1, L1A = see text
C2 = 25 μ F elec.	D1, D2 = 1N914 or similar
C3 = 0.02 μ F	Cx = see text

Receive Input coil wound on Amidon formers L1a over earthy end of L1				
L1	L1a	Wire	Former	Bands
34t	4t	24 swg	T68-2	80/40m
20t	3t	22 swg	T50-2	40/20 (15)m

Filter end of C10
on Transmitter

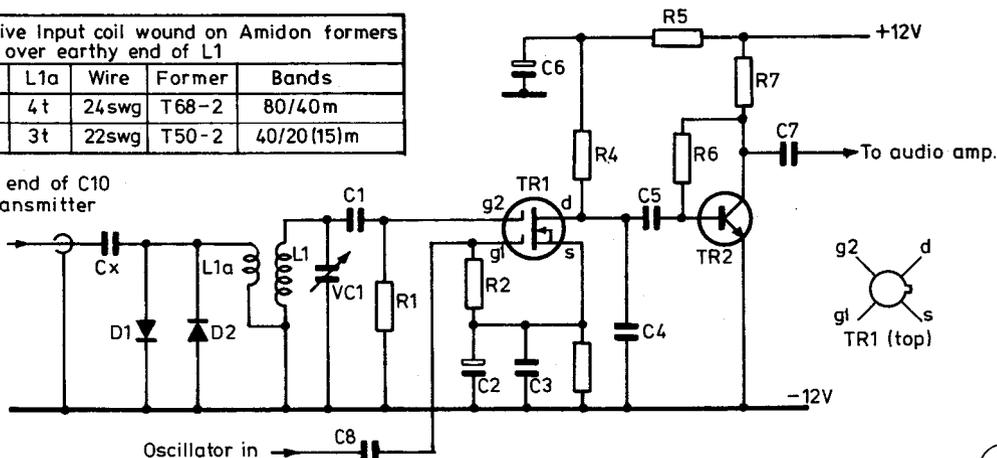


Fig. 1. "S.C.D." RECEIVER MIXER CIRCUIT

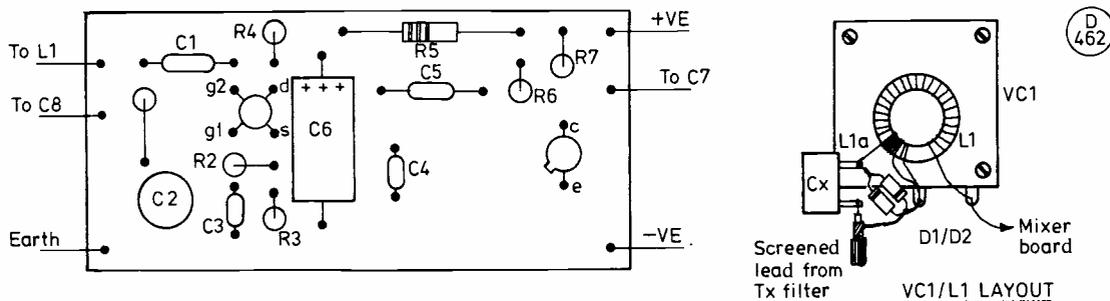


Fig. 2 RECEIVER MIXER BOARD LAYOUT

The internal, or local, oscillator source is the oscillator from the transmitter. This is fed into gate 1 of the mixer *via* C8; R3, C2 and C3 provide source biasing. R4 is the drain load, with C4 as RF decoupling for the output mixed signal.

The audio component is pre-amplified by TR2, from where the audio signal passes *via* C7 to an audio gain control VR1; C1 then feeds the audio signal to the integrated circuit amplifier IC1. It will be noticed that no audio filter is used; this will be added at a later stage when the basic transceiver is working. The output of IC1 is low impedance so it can be fed directly *via* C2 into either a small 8 ohm loudspeaker or a pair of low impedance headphones.

Construction

The layout for the mixer and audio pre-amplifier board is shown in Fig. 2. This board can either be a home etched printed circuit board or built on a matrix board. If the constructor has doubts about etching PCB board, 0.1 inch spacing perforated matrix board can be obtained. (This is rather like *Veroboard* except that it has no copper tracks.) The interconnections between the components can be made with copper wire on the underside of the board. The layout of Fig. 2 would suit either method of construction.

It is important that the dual gate MOSFET, which has four leads is connected the correct way. Early dual gate MOSFETS were fragile devices but this type is diode protected and has been wrongly connected and exposed to power by the author without damage. The device used by the author in all versions of this circuit has been the inexpensive substitute for the 40673, sold by *J. Birkett* (see any issue of *S.W.M.*). The board should present no problems in construction.

The most critical part of the mixer circuit is the input section which is external to the board. The transmitter described in *Part I* of the *S.C.D.* had filters which allowed operation on 80, 40 and 20 metres. An input circuit for L1/VC1 which tuned all three of these bands was attempted, but with poor results; therefore values for L1 and VC1 allow for operation on 80/40 metres or 40/20 metres. Although this limits the band capability of the transceiver, the result is simple construction, with options for 3 bands, two being available at any one time. (Incidentally, the prototype for the 40/20 metre coil also performed quite well on the 15 metre band.) It would be possible to switch two coils, but if this is attempted it is important to bear in mind that simple direct-conversion receivers are prone to cross modulation and broadcast breakthrough at the front-end,

and switching must be very direct and screened leads must be used throughout.

To eliminate the problems of breakthrough, the construction of the Cx to VC1 section must be carefully laid out, and the layout for the prototype is shown in the insert to Fig. 2. A screened lead brings the signal from the filter (output end of C10 on the transmitter) to Cx. The value of Cx is open to experimentation: try about 100pF to begin. The problem is to allow a value high enough to obtain sufficient sensitivity for the receiver without leaving the front-end open to excessive breakthrough. Also bear in mind that Cx remains connected to the transmitter output the whole time and too large a value will result in unacceptable RF loss of the transmitter signal.

Fig. 2 shows that the layout around L1/VC1 is tight. VC1 is a 250pF value obtained from a 250 + 250pF solid dielectric broadcast radio tuning capacitor. This can be readily bought, but how much better to cull one from a scrap "Far East Wonder" transistor radio! The two small diodes D1 and D2 should fit between the input lead to L1A and the earth screen which normally goes to the centre tag on such capacitors. The lead from the open end of VC1 and L1 should be as short as possible so the input end of the mixer board ought to be mounted as close as possible to VC1.

The oscillator injection for the mixer is taken from the oscillator on the transmitter board. The take-off point is the collector of TR2 on the transmitter board (junction of R4 and C5). A screened lead is used, the braiding being connected to the closest earthing point on the transmitter board. C8 is soldered to the mixer board using a short lead (*i.e.* shortening one of the capacitor leads). If the capacitor

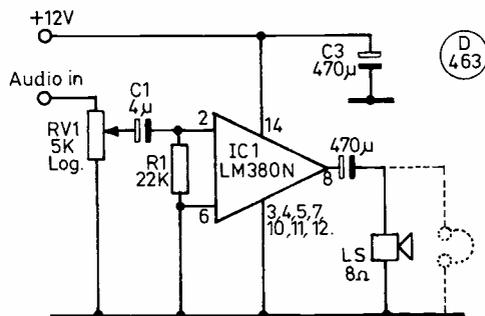


Fig. 3 "S.C.D." AUDIO AMPLIFIER

lead on the oscillator side of C8 is also shortened, it should be possible to connect the screen lead to the braiding of the screened lead to Cx. The audio pre-amplifier TR2 should present no problems and provide adequate drive for the LM380N amplifier; it will also prove its usefulness when an audio filter is added to the receive section. The mixer section may be tested by connecting a pair of high-impedance headphones between the output of C7 and ground.

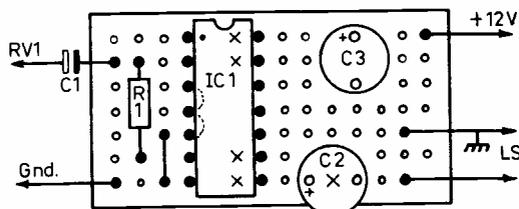
The audio amplifier board layout is shown in Fig. 4. The prototype was built of a piece of 0.1 inch matrix Veroboard, although PCB construction would be quite simple. IC1 was soldered directly into the board, but the more cautious could use a 14-pin IC holder. The Veroboard layout is easy to follow: the important points are to remember the breads in the copper strips (made with a drill bit) between IC pins 3, 4 and 5 underneath the board with a short piece of wire. This board may be tested before use, by connecting a loudspeaker and power, then applying a "finger hum test" to C1. Screened leads in and out of VR1 are useful but not vital. Some constructors express difficulty in mounting Veroboard because drilled holes cross or break the tracks; the easiest method is to hold them on the base with a little blob of putty such as *Blutack*.

Testing the Receive Section

When both boards have been completed the receive section is ready for test. Ensure that the inputs to Cx and C8 have been taken from the correct points, insert a suitable crystal in the VXO socket of the transmitter and apply 12 volts to both transmitter and receiver sections.

The receiver front-end should be carefully tuned with VC1. It is vital that the tuned circuit VC1 and L1 resonate on exactly the required receive frequency. Detuning VC1 far from the correct point will also certainly result in the reception of unwanted signals. Simple direct-conversions receivers are often prone to receiver front-end microphony; although this can be a slight problem it can also be an aid to tuning up the receive front-end. The prototype showed some microphony and provided a very simple front-end tuning check. When VC1 was exactly on tune, a tap on the case produced a slight 'pinging' sound in the audio output.

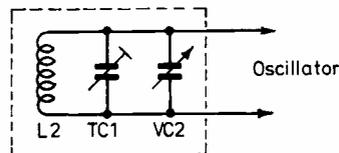
The sensitivity and inherent low noise of a simple direct-conversion receive should be apparent with the S.C.D. receive section. At this point the selectivity will be poor, but an audio filter can be added later. VR1 is the only gain control and gain should be used sparingly, with headphones



0.1" Matrix Veroboard (7 x 14 holes)
Pins 3 4 and 5 of IC1 joined under board
X denotes break in track.

Fig. 4 AUDIO AMPLIFIER LAYOUT

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VFO coils wound on Amidon formers					
L2	Wire	Former	TC1	VC2	Band
50 t	28swg	T50-2	50pF	50pF	80m
19 t	24swg	T50-2	200pF	50pF	40m

Fig.5 VFO TUNED CIRCUIT

suggested rather than a loudspeaker for CW work. The S.C.D. is now ready for use as a simple transceiver.

The transmit/receive facility allowed by the use of D1 and D2 will be enough to protect the front-end of the receiver with the key down. The rig can be used in this basic form without any switching at all — simply key to transmit. This is crude, but works with one evident difficulty: when keying loud thumps will come through on the audio signal. However at this basic stage, one can simply turn down the audio gain control, VR1. A more sophisticated transmit/receive arrangement will be added later.

Even with this simple form of operation the side-tone oscillator described in the first article on the S.C.D. can be used. The sidetone output from C2 of the sidetone circuit can be fed to pin 2 of IC1 in the audio amplifier circuit. This will allow the keying to be monitored, the level being adjusted on the sidetone circuit board with VR2. This is far better than keying "deaf" or using the receiver thumps to monitor the Morse.

In this basic form the S.C.D. can provide many useful QSOs. The prototype has worked throughout the UK on 80 metres and into Europe on 40 metres, using 90 feet of wire tuned with a simple L-match ATU. The basic S.C.D. has also been used on 20 metres with one crystal available to work most of Europe, the east coast of the U.S.A. and one Asia contact in the shape of a UA9. All 20 metre contacts were with a simple dipole in a north-south plane over the roof of the G3RJV QTH.

The basic S.C.D. should be operated like any QRP transceiver. Avoid calling CQ, wait for stations to call on the frequency or call a station on frequency at the end of another QSO. Key carefully and not too fast — no one can be a bully with QRP! Try to avoid saying you are QRP until the other station has given his report, it often makes a difference in what report is given! Then wait for the compliments of the other station and feel smug.

VFO Facility

Naturally, operating a crystal controlled or VXO controlled can be tedious at times and a QRP transmitter is all the better for full variable frequency operation. It is very easy to use the S.C.D. as a variable frequency transceiver provided that the limitations of such a simple design are taken into account. Sadly the simplicity of the system restricts the VFO operation to the lower frequency bands, but the addition is so simple as to be worth a try by any S.C.D. constructor.

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The VXO circuit for the transmitter described in the first S.C.D. article is capable of variable frequency operation merely by the addition of a tuned circuit. A simple L/C circuit like the one shown in Fig. 5 is used to replace X1 and VC1 in the gate circuit of TR1 of the transmitter. The principle is very simple, but the practice is prone to all VFO problems.

The tuned circuit arrangement of Fig. 5 must be built into a sturdy screen box, with stout and direct short leads; a slow motion drive of the simple epicyclic type will be required for VC2. A solid plug-and-socket arrangement is used between the VFO box and the transmitter. Almost any type of solid two pin plug and socket will serve, the prototype used some two pin types which had languished in the G3RJV junk box for years. It is really advisable to have a direct plug and socket connection between the VFO box and the transmitter as leads will ask for instability trouble: the plug is best mounted on the VFO box and the socket on the transmitter front panel. The socket on the transmitter is wired between the top pin of the crystal socket (C1) and chassis.

The addition of the VFO is open to individual experimentation, part of the joy (and frustration) of a simple transceiver. The prototype had individual VFO boxes for 80 metres and 40 metres, which were plugged in for the band required. The values for the tuned circuit can be copied from the values suggested, found by experimentation, or pinched from any other good VFO circuit. As the addition is so simple, the best method is to try and see. The author attempted a VFO on 20 metres but failed to get basic stability and obtained unacceptable frequency shift on keying. It may be that other S.C.D. builders may have more luck — that is what simple equipment building is all about!

VFO Operation

And now for the bad news. . . . In VFO operation with the prototype S.C.D. it was found that the input power usually had been reduced to prevent too much VFO frequency pulling. The setting up of the transmitter in the first part of the S.C.D. project described how to adjust the drive to the PA stage. In the VXO form, the author usually ran the transmitter with the Rx of the circuit as a direct short to the key. This amount of drive was found to pull the frequency of the VFO by an unacceptable amount when the transmitter was keyed. It is simple to check this by listening to the output on another receiver. Resetting the drive level can overcome this problem.

It is a simple matter to try low values of resistance in the Rx point of the circuit until the frequency shift is reduced to an acceptable level. The amount of shift must not be so wide that one is transmitting outside the audible bandpass of the receiver with the VFO control set in the same position. Any difference between the frequency of the VFO on transmit and receive can be checked by listening to the VFO on another receiver on transmit and receive. With a simple transceiver like this it is difficult to call a station exactly on the same frequency or zero beat, but practise will avoid annoying other operators or losing QSOs by being off-frequency.

It is quite possible to check the amount of frequency offset between transmit and receive by using a receiver. What is desired is to learn what the pitch of the other station's signal should sound like in order for the transmitter to be on his frequency. This ought to be very quickly

learned after a few QSOs, even without a check on another receiver (what may seem to be a problem has become second nature to many QRP transceiver operators who use a direct-conversion receiver and transmitter with a common oscillator). Another important factor is to remember to tune the band in the same direction each time, usually from low to higher frequencies, since the receiver will have a mirror image signal the other side of zero beat.

Receiver offset tuning will be aided in the next part of the S.C.D. project by the addition of Receiver Incremental Tuning. This will not only aid operation of the basic receiver, but be essential when audio filtering is used. Receiver Incremental Tuning, or RIT, will also prove its worth if much VFO operation is contemplated with the S.C.D.

The next part of the S.C.D. project will not only include the addition of RIT and an audio selectivity filter, but a SWR Bridge and an ATU idea that will enable the low power output to be used more effectively.

A DIGITAL CHANNEL DISPLAY FOR THE IC-240

IAN H. MOTH, B.Sc., GM8SOH

A Digital Channel Selector intended for the IC-240 2m. transceiver has already been described (*Short Wave Magazine*, January 1980). This was an inexpensive unit to build, and gave full 40-channel capability to the otherwise

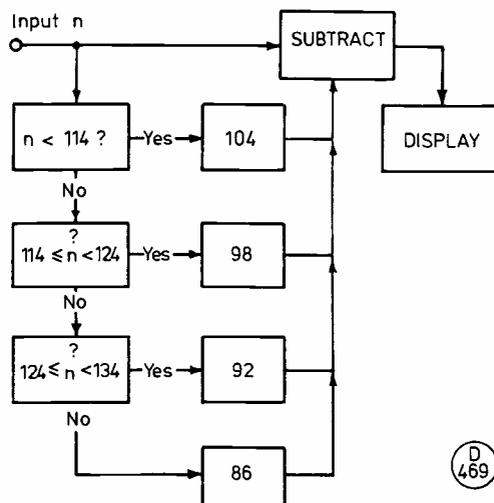


Fig.1 Logic flowchart of Digital Channel Display

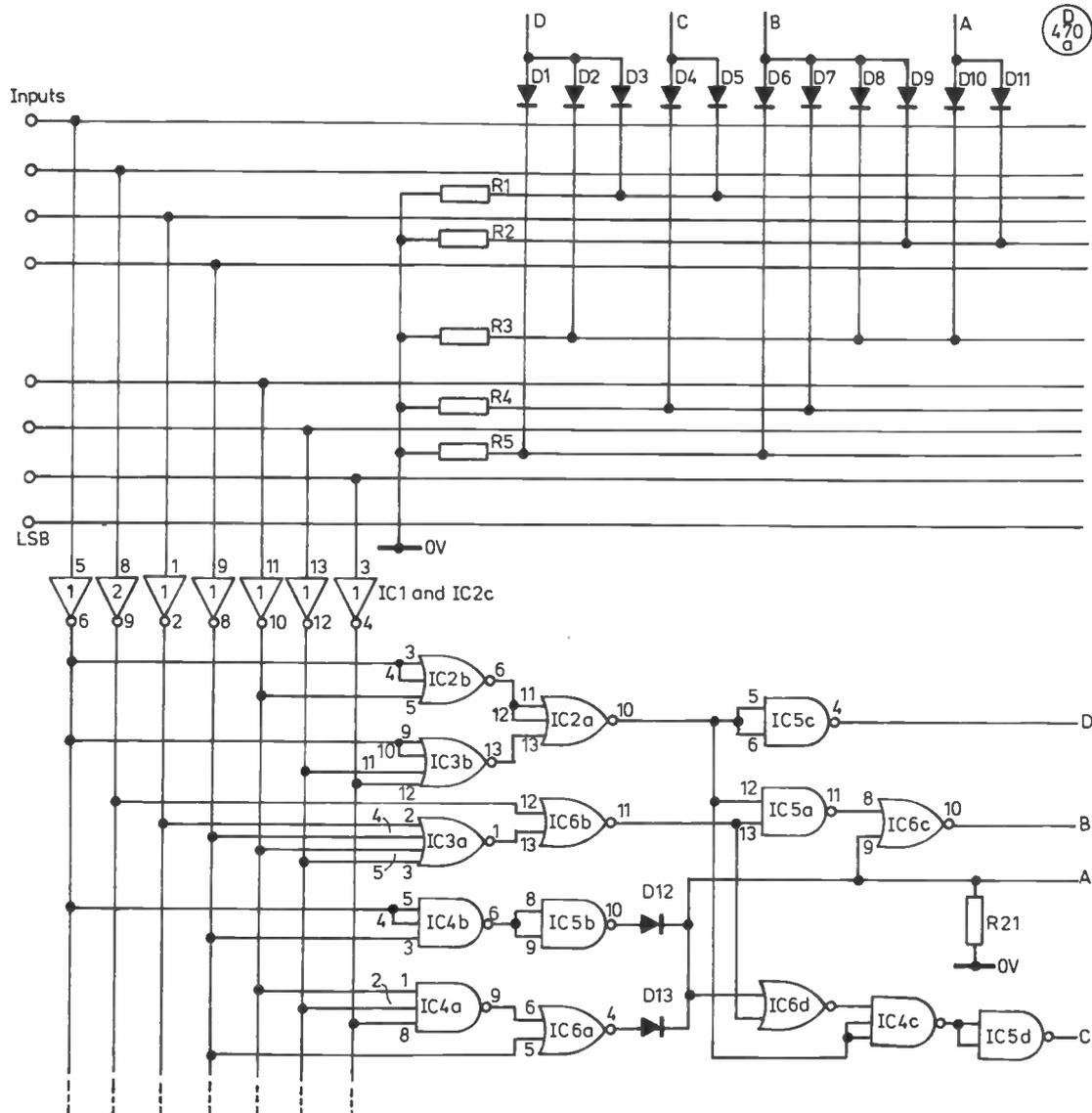


Fig. 2 DIGITAL CHANNEL DISPLAY CIRCUIT DIAGRAM

22 channel set. The unit to be described here is by way of a sequel to that project. It is a display unit which can be mounted remote from the transceiver and which displays the channel number to which the set is tuned. (A further development of the project is planned, whereby a scanner unit is included to scan across the band automatically. This will be published in due course, in the meantime it is the display facility which is described. The design is completely modular and the scanner can be added later.)

The IC-240 is a synthesised transceiver, deriving its frequency control from a reference oscillator and a programmable divide-by- n divider. It is not necessary here to go in detail into the working of this circuit; suffice to say

that (a) the value of n is crucial to the whole thing, (b) it is expressed inside the IC-240 as an 8-bit binary word, and (c) it is constructed inside the radio with a matrix of diodes and a 23-position switch. The 8 lines on the diode board corresponding to each bit of n can be wired out to the multi-way socket on the transceiver's rear so that access to this crucial diode board, and therefore the setting up and/or the reading of n by equipment accessories, is possible.

Operation of Circuit

Fig. 1 shows a block diagram of the logic by which the circuit arrives at the channel number, given the IC-240's code number. The difficulty is that the transceiver works

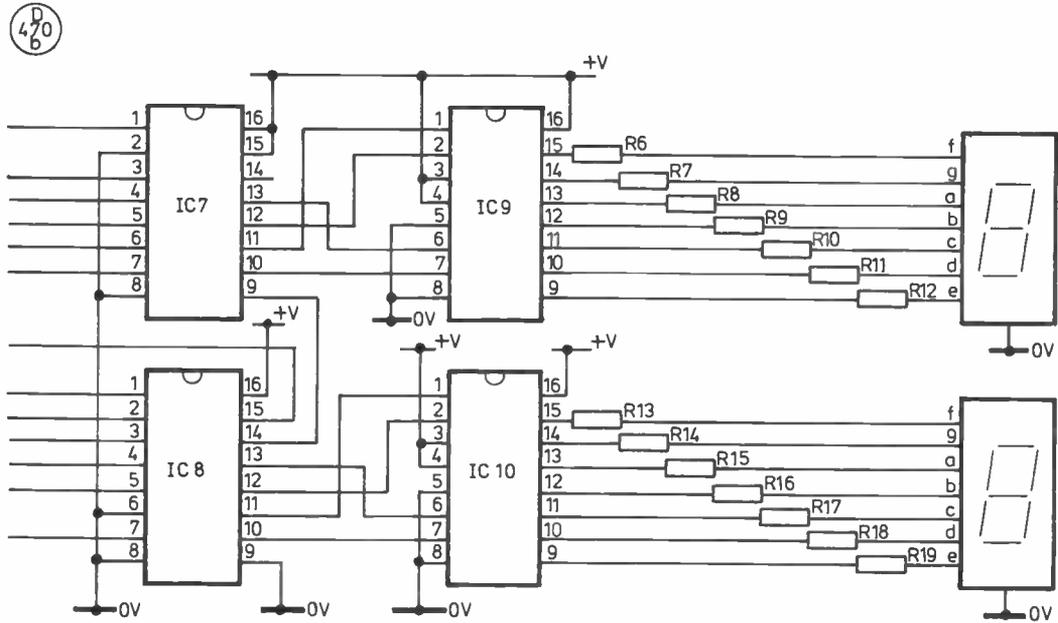


Table of Values
Fig. 2

- | | |
|-------------------------------------|-------------------------|
| R1 to R5 = 10K, 1/3w. 5% | Q1 = BD139 |
| R6 to R19 = 470 ohm, 1/3w. 5% | Display = two 7-segment |
| R20 = 180 ohm, 1/3w. 5% | LED's common cathode |
| R21 = 10K, 1/3w. 5% | IC1 = 4069 |
| C1 = 10 μ F, 16v. electrolytic | IC2 = 4000 |
| C2 = 100 μ F, 16v. electrolytic | IC3 = 4002 |
| C3 to C8 = 0.01 μ F ceramic | IC4 = 4023 |
| D1 to D13 = 1N914 or equiv. | IC5 = 4011 |
| Z1 = 9.1v. zener, 400mW. | IC6 = 4001 |
| | IC7, IC8 = 4008 |
| | IC9, IC10 = 4511 |

Miscellaneous: IC sockets, Veroboard, heatsink, case

between the numbers 104 and 143 (pure binary) to give channels 0 to 39 in the FM band. Integrated circuits are available to convert any binary number to binary coded decimal (or any other code for that matter) but several would be needed here and they tend to be expensive. Expensive projects to build are not attractive, so a much cheaper alternative has been found.

A subtraction operation is needed anyway, so use is made of the same function to effect a conversion. In mathematical parlance, the number is increased until its expression in hexadecimal notation matches the original number in decimal notation.

This is a difficult concept to grasp without recourse to lots of paper and pencil (a word of warning, don't become confused with this "new maths" nonsense, it's not all it's cracked up to be). An example will help better. Suppose the code number is 127 (decimal), i.e. secretly channel 23: this is between 124 and 134, so the 3rd box is activated and 92 is

subtracted. This gives 35 (decimal). The binary word representing 35 is 00100011; taking the last four bits on their own gives us a 4-bit word representing 3, and treating the next four bits similarly gives us 2. Thus when we say "hexadecimal 23" we mean 0010 0011, which happens to be equivalent to 35 in decent decimal terminology. It may be confusing to see that numbers are being subtracted on an integrated circuit which is advertised as an 'adder'. On this circuit there are 8 bits: therefore the highest number that can be handled is 1111 1111, or 255. So, if we wish to subtract 'x', then we may add 256-x. This is the mathematical basis for the circuit.

Circuit description

Fig. 2 shows the schematic layout. ICs 7 and 8 perform the arithmetic, adding the number from the radio to one of the four numbers set up by the diodes. The input number is buffered by the inverters which also serve to make the logic design slightly easier. According to the input number, either

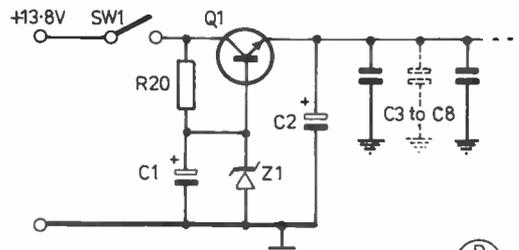


Fig. 3 POWER SUPPLY

The transistor will require a heatsink. Capacitors C3 to C8 are IC power supply decoupling capacitors, and should be distributed over the board close to the IC's.

A, B, C, or D will be activated, thereby setting up a particular number. IC9 and IC10 are simple binary to 7-segment decoders, driving 7-segment LED displays.

Fig. 3 is a suggested power supply. It is a conventional emitter-follower design and should cope with the variation in current demand inherent with the LED display. Q1 will require a heatsink, one of about 20°C/W would be adequate for the transistor specified. A suitable one might be made from bent aluminium sheet (start from a piece 20mm x 60mm, or more).

Construction

Layout is not critical and *Veroboard* is recommended. A DIP breadboard could be used, but standard 0.1" matrix with tracks cut in appropriate places is probably a better bargain. It may be prudent to mount the display with display drivers on a separate board to ease mounting problems, since the display will almost certainly be required at the edge of some box. The interconnecting wiring will be tedious and should be approached with method and a fair temper. Be satisfied with "slow but sure". Do not route the wires haphazardly but arrange them in channels. The wires can then be gathered up and tied to make a neat harness and a professional looking job. It will be an advantage to use a very light and flexible wire.

Interfacing

The procedure for bringing the binary word from the diode board on the IC-240 to the socket on the transceiver's rear was described in the Digital Channel Selector

project and it is not proposed to repeat it here. (In case of difficulty apply, with *s.a.e.* please, direct to the author.) The display module could be used if required with the above mentioned DCS, an interfacing socket being fitted either to the Display Module or to the DCS, the pins being tapped onto the binary word lines. An ordinary B9A valve base is a suitable socket.

Operation

The module may be operated off the same supply as the transceiver. If a separate supply is used there must be a cable connecting 0 volts on the display module to 0 volts on the radio. The display module will not work with a floating supply. Another precaution to observe is not to allow any signals on the inputs to the CMOS ICs unless the supplies are on. In practice this means never switch on the module unless it is plugged in to the transceiver, and never switch off the module without first switching off the transceiver.

Summary

The foregoing project is quite straightforward and should present very few difficulties. There is plenty of scope however, for personal design and modification. As will be shown in a future article, the design may be uprated to a full scanner offering facilities comparable to the commercial product at a fraction of the price. Another advantage of course, is that the constructor may enjoy the satisfaction of having built it himself.

The new Sugiyama F850 transceiver, available from Zycomm Electronics Ltd., 47 Pentrich Road, Ripley, Derbys. DE5 3DS. The mains/battery F850 covers all the amateur bands with all modes, minimum output is 10 watts SSB/CW/FM (5 watts AM); features include VOX, speech processor, a 25 kHz marker, repeater shift and automatic toneburst.



CLUBS ROUNDUP

By "Club Secretary"

HOW nice it is to turn to our task in a contented frame of mind, knowing the last *Roundup* got out on time, and that we have a fat clip for this time. Indeed the clip is so fat that we may have to be a little perverse and prune down the multiple-entries from whom we've not heard lately.

More contentment: your conductor is, for the first time in a quarter of a century, not in any office of any club, radio or otherwise. What a blessing it is to have a rest! It won't last long of course — once it's been noted that committee meetings are things of the past, decorator's gear will be brought out and shoved under my nose!

However, let us turn to more interesting things than decorating!

Anywhere

Applies, we would think, to any club without a local affiliation: a national or international group. And, sure enough our first one is definitely just that, being the **G-QRP Club**. They are now up to some 700 members, and growing steadily; most of this is undoubtedly the interest aroused by low-power operating, but it is also much connected with the presence of a newsletter which is a pleasure to read. And a group of officers who accept that an AGM is all but impossible and just carry on, taking their guidance from the "feel" of the membership they get on the air and through letters. Note the Hon. Secs. address has changed again — see Panel.

The **Royal Navy** is another big group. If you served in it, or in the Merchant Navy, or a foreign navy, you qualify for membership. They also of course have their subsidiary groups, such as the one at *HMS Belfast*, who by the way will be operating GB2RN for their Easter Activity period, round the clock for several days. All details from the Hon. Sec. — see Panel.

Over the water to Eire where the national society, **I.R.T.S.**, is the contact if you want to find the local club — there are several local clubs, and the *IRTS News* is a delightful chat sheet, keeping all the members in touch with each other. The result is a 'personality' thing which makes you visualise the person concerned.

This same thing is the forte of the "Radial", newsletter of **R.A.I.B.C.** to whom one should point any disabled SWL or radio amateur. Of course they would like to hear from anyone who can help them in any way: reading "Radial" on to tape for blind members, cassettes for RAE courses, transporting things from A to B, repairing and servicing equipment or whatever. And of course, donations!

Next, **B.A.R.T.G.** and here we must say that one doubts whether it would be possible for the average chap to put together an RTTY station without some help from **B.A.R.T.G.** — there is the newsletter, and the "shop window" not to mention the Convention.

B.A.T.C. covers the interests of the number among us who are into amateur TV, whether by way of the normal fast-scan low-definition TV, SS/TV on the world-wide bands, or whatever. All are covered adequately in the

magazine *CQ-TV*, of which we have Issue 108 in front of us.

Everyone who is involved in amateur radio has heard of *Oscar* (Orbital Satellite Carrying Amateur Radio), and most maybe know also of the Russian ones, RS1 and RS2. **AMSAT-UK** is the British arm of the international AMSAT organisation based on Washington. If their Phase III plans are going to come to fruition as the past ones have, then they need members — lots of them. Among them one hopes there will be some who can *actively* help in one way or another. Write to the Hon. Sec. at the address in the Panel.

Southerly

Acton, Brentford & Chiswick start the story; their old Hq having been burnt down, the Hon. Sec. says they will be at Chiswick Town Hall, High Road, and that members will be discussing their technical problems.

At **Barking** the main evening is still Thursday of each week, at Westbury Recreation Centre, Westbury School, Ripple Road, Barking, but the club shack is accessible to members on the other evenings should they desire.

If you are in **Cambridge** you will find the club at the ATC Hq, 730 Newmarket Road, Cambridge, Cambs. The general routine, says the Hon. Sec., is to alternate formal evenings, with talks, lectures, films or whatever — with others being informal. However, the first Friday in each month is set aside for beginners and new chums.

Deadlines for "Clubs" for the next three months—

(April issue—February 29th)

May issue—March 28th

June issue—April 25th

July issue—May 30th

Please be sure to note these dates!

Cheshunt are in business every Wednesday, at the Church Room, Church Road, Wormley; March 5 is down to G8LNM who will be co-ordinator for a showing of club slides. On March 19 G3AAJ will be putting on his "other hat" as Region 19 RSGB rep., which leaves 12th and 26th for a natter evening with RAE and Morse.

At the time of writing the **Chiltern** club will be in AGM-time. Venue is the canteen of John Hawkins Ltd., Victoria Street, High Wycombe; March 26 is the next date there and is down for the Construction Contest. And, it is nice to note, the newsletter carries a note of thanks to Brian Hawkins for the meeting-place facilities he provides.

Now **Clifton** where we hear they are still foregathering at 225 New Cross Road, which lies opposite New Cross Bus Garage, every Friday. More details from the Hon. Sec. at the address in the panel.

We have the regular newsletter from **Crystal Palace**, and from it we deduce that they get together on March 15 — one of the few clubs to have a Saturday date — and at the time of writing the subject is to be advised.

We don't have anything firm from **Crawley** although we understand they have the fourth Wednesday at Trinity

United Reformed Church Hall, Ifield, Crawley. At the time of writing this they have just had an AGM, so we don't know who should go in the Panel as yet; we feel sure the present name and address will serve for just this once more.

Dover have every Monday and Wednesday at S.E. Kent YMCA. Mondays is kept open for beginners, RAE class work, and Morse, while the Wednesdays are the "proper" club evenings. March 5 is a Natter Night, and on 12th G8EGT will be talking about Test Gear. On 27th the Activity Night will concentrate on Twenty, and on 26th the constructors' efforts will be judged, with awards being presented at the AGM.

East London RSGB have G3AAJ, who will be talking to them about Microprocessors. This one is on March 16, at Wanstead House, 21 The Green, Wanstead, E.11 at 1500 on this, and every other, third Sunday. Further details from G3PKQ, the Hon. Sec.

Edgware are at Watling Community Centre, 145 Orange Hill Road, Burnt Oak, Edgware; March 13 sees G3TDR giving a talk on SSB Transceiver Construction (it's about time someone dispelled the myth that something like an SSB rig is difficult to build — how about turning that into a tape-and-slide lecture?). The informal at the same venue is on Marh 27.

At **Guildford** we gather the gang have been having a go at the RSGB RR on the subject of the club reports, and, indirectly, comparing their's with this piece. To be fair, we get the reports in directly to Welwyn and the whole wodge is sorted and dealt with by the writer (with, on occasion, a dictionary of cuss-words!). Also, we don't get quite so many reports, so we try to make the piece into a narrative but reduced as far as we dare without coming down to the simple listing, which is such a bore to read. We never cease to be surprised to hear how many people read *Clubs Roundup* from beginning to end! When all is said and done the local club is the place where the game nearly always starts for a beginner. March 14 is the date for a Tag Bring and Buy Sale — name your own price and haggle (no hookahs provided!) at the Model Engineers Hq in Stoke Park on the second and fourth Friday of the month. Incidentally, one of the delights of being "Club Secretary" is the humour — the current issue of the newsletter has a quite hilarious piece about the early days of TV, by G6NA.

Every Tuesday evening they all head for Mark Hall Barn, First Avenue, **Harlow**. April 1 is down, appropriately enough for a Junk Sale!

At **Harrow**, a temporary *Newsletter* writer steps in for the chap who had to give up due to work commitments — and for a first try we think it was great. On the front cover is the vital information which is that they are to be found on every Friday at Harrow Arts Centre, High Road, Harrow Weald, Middx.

Ipswich next, and here they have a first copy of what they hope will be a regular newsletter; and we very much like the idea that they carry details not only of their own doings but also that of **Colchester**, **Martlesham** and **Bury St. Edmunds** clubs. So for the latest details, contact the Hon. Sec. — see Panel for his address. They are still on the look-out for a new QTH, though at the time of writing hope seems to be fading.

March at **Maidenhead** means 6th and 18th. On the first date mentioned, we gather someone is going to do a talk and demonstration on Power Supplies — how, and how *not* to do it. Something lots of us could bear to know about it,

come to think about it! The other date is for the AGM — everyone to turn up please.

Melton Mowbray are based on the St. John's Ambulance Hall, Asfordby Hill, and on Friday March 21 they will have a Quiz evening with some prizes to be won.

That building at **Mid-Sussex** which adorns the front cover of their newsletter is in fact the Marle Place F.E. Centre, Leylands Hill, Burgess Hill. March 6 is an SWLs evening, and on March 20 Commander Hatfield returns.

On we go now to **Reigate** who have the third Tuesday of each month at the Constitutional and Conservative Centre, Warwick Road, Redhill.

We hear that **Salisbury** recently held an AGM, and G2FIX is now in the "hot seat" from which he emerges to tell us that they can be found in the Salisbury Activity Centre every Tuesday evening. On a point of history, this club has records going back to 1924, and Sir Oliver Lodge was their Foundation Patron. And in 1980 their Morse classes must be something unique in that the instructor is G5YN, who once used his key on the bands from AC4YN if memory serves aright. We wonder if it's the same key?

More local to us is **Southgate** where for March the club project of a counter will be discussed. The routine to remember is that they have the second Thursday of each month at the Scout Hut in Wilson Street, Winchmore Hill Green.

At **Stevenage** the front cover of their *Newsletter* sets out in all detail the menu for the annual dinner. As for meetings, we note they have March 6, which is open at the time of writing, and March 20 for the AGM.

A special letter this time from **Surrey** replaces the usual newsletter, and tells us that they are to be found in *T.S. Terra Nova*, 34 The Waldrons, on the first Wednesdays. This gives us March 5 a Surplus Equipment Sale, and on 19th an informal with the club station on the air. Looking forward to April 2, they have the AGM; the club is now 45 years old, but the war-time suspension of activities means this is only the 39th AGM.

Not so very far away is **Sutton & Cheam**, from whom we have a letter indicating that they have their Annual Dinner and Dance at the Woodstock Hotel, Stonecot Hill, North Cheam, on March 22. Tickets from L. Sandall, 19 Mount Park, Carshalton, Surrey, at £7 each. Friday March 14 is the date for their regular formal session at Sutton College of Liberal Arts, and Dr. Underhill will be talking to them about Quads and other aerials.

It isn't very often we hear from **Vange**, but this time they are noting the date of their Mobile Rally — September 7 at Nicholas School, St. Nicholas Lane, Basildon. As for their normal activities, they are to be found every Thursday evening at Bastable Community Centre, Long Riding, Basildon, where any visitor, licensed or SWL, will be welcome.

Verulam are next, and they have their date at the Jubilee Centre, Catherine Street, St. Albans, on March 27, when they will be hearing a talk about Frequency Synthesis and Receiver Design, by G8CYK. The informal on the 2nd Thursday in each month is at the R.A.F.A. Hq in Victoria Street through the colder months.

West Kent are based on the Adult Education Centre, Monson Road, Tunbridge Wells, where on March 14 Ian Daniels will be showing his home-made colour TV camera and 10 GHz microwave link. They also have informals at

Names and Addresses of Club Secretaries reporting in this issue:

- ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, London W3 8LB. (01-992 3778)
- AMSAT-UK: R. Broadbent, G3AAJ, 94 Herongate Road, Wanstead Park, London E12 5EQ.
- BARKING: A. Sammons, G8IZN, 80 Lyndhurst Gardens, Barking, Essex. (01-594 2471)
- B.A.R.T.G.: J. Binning, G3AJS, 293 Perry Street, Billericay, Essex.
- B.A.T.C.: M. Cox, G8HUA, 13 Dane Close, Broughton, Brigg, South Humberside.
- BURY: M. Bainbridge, G4GSY, 7 Rothbury Close, Bury, Lancs. BL8 2TT. (061-761 5083)
- CAMBRIDGE: D. Wilcock, G2FKS, 19 Cavendish Avenue, Cambridge CB1 4UP. (Cambridge 47220)
- CHESHUNT: R. E. Chastell, G8LNM, 4 Fairley Way, Cheshunt, Herts. EN7 6LG. (Waltham Cross 35393)
- CHILTERN: N. C. Ambridge, G4FRL, 53 The Avenue, Chinnor, Oxon. OX9 4PE. (Kingston Blount 52006)
- CLIFTON: R. A. Hinton, 42 Sutcliffe Road, Welling, Kent.
- CORNISH: S. T. S. Evans, G3VGO, "Glengormley," Carnon Downs, Truro, Cornwall. (Devoran 864255)
- CRAWLEY: A. V. H. Davis, G3MGL, 41 Gainsborough Road, Crawley, West Sussex RH10 5LD. (Crawley 20986)
- CRYSTAL PALACE: G. M. C. Stone, G3FZL, 11 Liphook Crescent, London SE23 3BN. (01-699 6940)
- DOVER: K. A. Crouch, G8KEN, 14 Victoria Road, Capel-ferne, Folkestone, Kent CT18 7HB. (Folkestone 55241)
- EAST LONDON RSGB: R. Holmes, G3PKQ, 92 Dunedin Road, Leyton E10 5NJ. (01-558 2928)
- EDGWARE: D. L. Lisney, G3MNO, 119 Draycott Avenue, Harrow HA3 0DA. (01-907 1237)
- EDINBURGH: M. Darke, GM3KKG, 44 Inverleith Row, Edinburgh. (031-552 4593)
- G-QRP Club: Rev: G. C. Dobbs, G3RJV, 17 Aspen Drive, Chelmsley Wood, Birmingham B37. (021-770 5918)
- GUILDFORD: L. Bright, G4BHQ, 4 Dagle Farm, Shalford, Guildford, Surrey. (Guildford 76375)
- HARLOW: A. C. Keeble, G4HPL, 4 Manor Cottages, Debden, Saffron Walden, Essex CB11 3JY.
- HARROW: C. D. Friel, G4AUF, 17 Clitheroe Avenue, Harrow, Middx. HA2 9UU. (01-868 5002)
- IPSWICH: J. Tootill, G4IFF, 76 Fircroft Road, Ipswich, Suffolk IP1 6PX. (Ipswich 44047)
- IRTS: G. Gervin, E18CC, 185 Elton Court, Leixlip, Co. Kildare.
- JERSEY: S. Smith, GJ8EZA, 19 Parade Road, St. Helier, Jersey, C.I. (Jersey 23249)
- KIDDERMINSTER: R. Manston, G4ILQ, 7 Osborne Close, Offmore Farm Estate, Kidderminster, Worcs. DY10 3YY. (Kidderminster 4930)
- LIVERPOOL: A. Neilson, G4CVZ, 79 Ackers Hall Avenue, Liverpool L14 2EA. (051-220 5470)
- LOUGHOR: T. Griffin-Thomas, GW8TYS, "Riverside Manor," 77 Castle Street, Loughor, Nr. Swansea. (Swansea 893392)
- MAIDENHEAD: J. Patrick, G3TGW, Bedford Lodge, Camden Place, Bourne End, Bucks. (Bourne End 25275)
- MALVERN HILLS: Hugh C. Nash, G8JAO, 3 Wilton Road, Great Malvern.
- MELTON MOWBRAY: R. Winters, G3NVK, 32 Redwood Avenue, Melton Mowbray, Leics. LE13 1TZ. (Melton Mowbray 3369)
- MIDLAND: N. Gutteridge, G8BHE, 68 Max Road, Quinton, Birmingham B32 2AN. (021-422 9787)
- MID-SUSSEX: J. Brooker, G3JMB, 20 Farnham Avenue, Hassocks, Sussex.
- NORTH DEVON: H. G. Hughes, G4CG, Crinnis, High Wall, Sticklepath, Barnstaple, Devon.
- NORTHERN HEIGHTS: M. Topham, G8NUC, 1200 Great Horton Road, Bradford. (Bradford 73271)
- NOTTINGHAM: M. C. Shaw, G4EKW, 50 White Road, Nottingham NG5 1JR.
- ORMSKIRK: J. K. Higgins, G4IGX, 8 Delph Top, Greetby Hill, Ormskirk L39 2DX. (Ormskirk 75546)
- PLYMOUTH: H. Hooper, G3CWC, Station House, Tavistock North, Tavistock, Devon.
- RAIBC: Mrs. F. Woolley, G3LWY, 9 Rannoch Court, Adelaide Road, Surbiton KT6 4TE.
- REIGATE: J. S. Roberts, G8FDJ, 15 Bakehouse Road, off Horley Row, Horley, Surrey.
- ROYAL NAVY: M. Püttick, G3LIK, 21 Sandyfield Crescent, Cowplain, Portsmouth, Hants. (Waterlooville 55880)
- SALISBURY: A. C. A. Newman, G2FIX, 74 Victoria Road, Wilton, Salisbury, Wilts. SP2 0DY.
- SCARBOROUGH: Mrs. M. A. Crofts, G4JAO, 43 Broadlands Drive, East Ayton, Scarborough, N. Yorks. YO13 9ET.
- SOLIHULL: R. A. Hancock, G4BBT, 80 Ulleries Road, Solihull, West Midlands B92 8EE.
- STEVENAGE: E. Godfrey, 94 Common View, Letchworth. (Letchworth 72184)
- SURREY: R. Howells, G4FFY, 7 Betchworth Close, Sutton, Surrey SM1 4NR. (01-642 9871)
- SUTTON & CHEAM: G. Brind, G4CMU, 26 Grange Meadow, Banstead.
- VANGE: Mrs. D. Thompson, 10 Feering Row, Basildon, Essex.
- VERULAM: A. Clarke, G8MAE, 24 Kiln Ground, Hemel Hempstead, Herts. HP3 8EZ. (Hemel Hempstead 64751)
- WEST KENT: B. P. Castle, G4DYF, 6 Pinewood Avenue, Sevenoaks, Kent TN14 5AF. (Sevenoaks 56708)
- WEST OF SCOTLAND: I. E. McGarvie, 3 Kelso Avenue, Paisley, PA2 9JE.
- WORCESTER: M. Tittensor, G4EKG, 16 Durcott Road, Evesham, Worcs. WR11 6EQ. (Evesham 41105)
- YEOVIL: D. L. McLean, G3NOF, 9 Cedar Grove, Yeovil, Somerset. (Yeovil 24956)
- YORK: K. R. Cass, 4 Heworth Village, York.

the Drill Hall, Victoria Road, every alternate Tuesday throughout the year.

Wales and West

First in are **Cornish**, on the first Thursday of each month at the SWEB Clubroom, Pool, Camborne. For March they have a film from the Marine Department of Plymouth Technical College, and in April they have a film on System Protection with G3XFL 'driving' (this to follow immediately on the business of the AGM).

Off-shore now to **Jersey, C.I.** where they all are DX thanks to the GJ prefix! They are in session on March 13 for a demonstration of FAX operation. The newsletter does not say so in as many words, but we deduce that they foregather at the Quennevais Communicare Centre. If in doubt, contact the Hon. Sec. — see Panel.

At **Loughor**, where the Hq is Loughor Boating Club, the Hon. Sec. says they still get together on the second Monday of each month; if you want to look them up, contact the Hon. Sec. for details of the route, and while you're at it, you could also congratulate him on his new callsign GW8TYS. Long may he enjoy it!

It seems an age since we last heard from **North Devon**; they grew out of G4CG's front room as the numbers increased and now have a booking at Pilton Community Centre, on the second Wednesday of the month, while the fourth Wednesday sees them all cram into G2FKO's QTH at 38 Clovelly Road, Bideford.

An SWL member of **Plymouth** writes in because he feels they've not been mentioned for a long time. True enough, and we note a change of Hq address too, to Whiteleigh Methodist School on alternate Mondays. He's hoping to

have his call by the time this reaches print — we have our fingers crossed!

What about **Yeovil**? They have every Thursday at Building 101, Houndstone Camp, Yeovil, not to mention the club net on Sunday mornings at 1030 around 3.660 MHz. Oh, we nearly forgot to mention their RAE and Morse classes which are run as required.

Midlands

First stop here is **Bury** who have Tuesday nights at the Mosses Community Centre, Cecil Street, but the second Tuesday is normally the 'big' one with a lecture or a film show, or other formal activity.

Kidderminster are now meeting fortnightly at Aggborough Recreation Centre, Hoo Road, Kidderminster. March 18 is down for a showing of three films — *One Man's Meat*, *Hams Wide World*, and *Electron's Tale*. As for March 31, they have accepted a challenge from Worcester club at skittles and home-construction. That should keep everyone occupied!

Up to **Liverpool**, where the Hq is at the Conservative Rooms, Church Road, Wavertree, and the routine is weekly on Tuesdays. For March this means on March 4 a talk by G8CFM, followed on 11th by a Bring and Buy sale. March 18 sees *More Magic* at the hands of G3SIW, and on March 25 comes the club constructional contest.

A fairly new club, and certainly a new one to the writer, is the one called **Malvern Hills**, who are to be found at the Star in Cowleigh Road, North Malvern, Worcs, on the second Tuesday of each month.

Midland's Newsletter this time has a fine picture of two enthusiastic decorators, presumably preparing their new Hq in Broad Street; and inside is a very good "starter" article on Microprocessors. The new place isn't completed yet so on March 18 they will be at the University of Aston — it says Room 110 against the date but we suspect a slight hiccup in typing the "skin" which would make Room 118 more likely.

There is a regular entry saying 'forum' in the **Nottingham** programme. It appears on March 6, while on 13th there is a debate on the motion that "amateur radio is dead". March 20 is an Activity Night and on 27th D. Molyneaux will be talking about Moonbounce. And of course we must mention the venue, which is Sherwood Community Centre, Mansfield Road (opposite Woodthorpe Drive).

On we go now to **Ormskirk**, where they are to be found on Tuesdays in the 'Over Sixties' Hut in Liverpool Road, opposite Christ Church starting at 8.30 p.m.

Solihull are still foregathering in the Manor House, High Street at 7.30 on the third Tuesday of each month; March 18 sees Paul Jessop, G8KGV giving a talk on Micro-

processors. They also have a Top Band net at around 1960 KHz, 21.30 on Friday evenings.

The **Stourbridge Newsletter** indicates meetings on March 3 for a constructional session, and March 17 for the AGM. Although it isn't mentioned in the newsletter our records say the venue is the Library in Longlands School, Brook Street.

The main part of the **Worcester** newsletter is taken up by notes on the new bands, but it is nice to see that the fall-away of numbers at the Old Pheasant meetings has been turned round with lots of new members appearing on the first Monday of each month. March 3 is down for a talk on Microprocessors which will include a demonstration. On March 31, they have the Annual Constructional Contest and the skittles evening already mentioned with the Kidderminster gang.

Up North

Edinburgh start this section; they are to be found on Tuesday evenings in premises at the City Observatory, Calton Hill, Edinburgh, where sometimes they operate a station, sometimes natter and sometimes have lectures or film shows.

Northern Heights have a construction contest on March 12, and on March 26 three members combine forces to present a talk on Microcomputer Basics. The venue is the Bradshaw Tavern, Illingworth, Halifax, every Wednesday evening.

Scarborough are to be found on Monday evenings at the Cricket Club in North Marine Road. The first date each month is a Junk Sale, two evenings each month are set apart for talks of some sort, and the remaining one or two are occupied with operating. (We do hope nobody walked on the sacred "square" in the process of putting up the aerial!).

Back to GM, and **West of Scotland**, where we deduce the dates as being March 14 and 28, at 22 Robertson Street, Glasgow G2.

York are the back-markers this time, getting together every Friday at the United Services Club, 61 Micklegate, York with the *exception* of the third Friday in the month.

Conclusion

It's all been done for another time, and it only remains to wish you "all the best", and remind you that the deadline dates are in the 'box' in the body of the piece. Most of the serial-entry efforts need to be up-dated — club scribes please take note.

And of course your letters should go to "Club Secretary", SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ.

April issue will appear on Friday, March 28th

VHF BANDS

NORMAN FITCH, G3FPK

Awards

JACK Mitchell, G3KEQ, becomes the eighth reader to win a QTH Squares Century Club Certificate. His award is for 2m. operation from Sanderstead, about 1.4 kms. from your scribe's QTH. An interesting feature of the submission was that all the cards were for contracts outside England and *via* tropospheric propagation only. The present station comprises a *Trio* TS-700G driving a *Nag* amplifier, the aerials being two, stacked 9-ele. *Tonna's*. Jack has an enviable QTH 160m. *a.s.l.* on the North Downs with a fine "take-off" all around so it is no surprise that his list included cards from BC square to the south, CW to the north and KM to the east.

Three more VHF Century Club certificates for 2m. operation have been awarded. No. 313 goes to Fred Barnes-Rickers, G8JKN, from Kenilworth (Warks.). He has been interested in radio since the 1920's starting his *s.w.l.* career with a crystal set in a matchbox, later building many different straight and superhet receivers. 52 years after leaving school, he decided it was time to get an amateur licence so took a day course at Salisbury College, continuing with evening classes after moving to Warwickshire. Fred passed the *R.A.E.* in 1974.

Norman Barnacle, G8OMI, from Shirley (W. Midlands) receives VHFCC award no. 314. His interest in the hobby dates back to 1932 and the pre-war 5m. days using home built Rx's. *S.w.l.* activity continued up to 1956 using ex-services gear. In 1977, he started up again and has been on 2m. SSB exclusively since December of that year. The present station consists of a *Yaesu* FT-221R with *S.E.M.* pre-amplifier and 40 watts linear. The aerial is a 4-ele. *Quad* at

28 ft., the QTH being 470 ft. *a.s.l.*

George Gullis, G8MFJ, from Avebury (Wilts.) took two years to accumulate the cards for award no. 315. His collection includes QSL's from HB9AMO/P, I4XCC, YU2CKL and YU4VIP. George's present station is an *Icom* IC-202 driving the popular *Nag* amplifier with a 9-ele. *Yagi*.

Beacon News

The January gales took their toll of the Isle of Wight beacon, GB3IOW, destroying the aerial system and the PA. It will likely be some time before the service is resumed. The final aerial system has now been installed at GB3BTO (AM77j) on 1296.83 MHz. It comprises two, 17 ft. long slotted waveguides with a gain of 16 dB. and pointing east and west. The beam widths at -3 dB. and -10 dB. points are 90° and 190° respectively. Each aerial is fed with 10 watts.

The Belgian 2m. beacon, ON4VHF, (CK23e) which used to be right at the top end of the band, is now operating on 144.985 MHz in accordance with the Region 1 plan. Further afield, ZS6NN in Bloomfontein is operating on 50.029 MHz with 200 watts to four 13-ele. *Yagis* beaming north as from Feb. 1.

Contests

Results: — The results of the 144 MHz Fixed Contest on Dec. 2 are to hand *via* GB2RS. In the Single operator section, G3BDQ (Hastings) was the winner with 3697 pts. from 257 QSO's. G8KMW (Cams.) was second with 3014 pts. from 328 exchanges. The Multi-operator part was convincingly won by G3ZIG/A whose 360 contacts earned 4470 pts. G4IJE (Essex) was second with 3350 pts. from 354 QSO's. **Coming events;** — The *AGCW-DL* UHF CW Contest is scheduled for March 15, 1900-2300 GMT. As previously there are three classes; A being less than 3.5 watts RF; B less than 25 watts and C more than 25 watts. Exchanges to consist of usual RST and serial number plus class and QTH locator; *e.g.* 579001/B/EL25a. Scoring is dependent upon class, *viz:* — A/A 9 pts; A/B 7; A/C 5; B/B 4; B/C 3 and C/C 2. There is a multiplier made up of one point for each square and 5 pts. for each DXCC country. Final score would be the QSO points total times the sum of all the multiplier points. Entries to be mailed by March 31 to Edmund

Ramm, DK3UZ, P.O. Box 38, D-2358 Kaitenkirchen, Fed. Rep. of Germany.

The Barking Radio & Electronics Society's 144 MHz event is scheduled for Mar. 30 at 1300-1700 GMT. There are three sections. 1 is all stations in the *postal* county of Essex and 2 is for all operators residing outside Essex. Section 3 is *s.w.l.* Scoring is 1 pt. per contact but QSO's with G3XBF/P will be worth 10 pts. The multiplier is the total number of U.K. *postal* counties worked with *countries outside the U.K.* classed as countries. Exchanges are to consist of RS(T), serial number and *postal* county. Entries within 15 days to G8IZN, 80 Lyndhurst Gdns., Barking, Essex, IG11 9XZ.

Repeater News

The licences have been issued for eleven more UHF repeaters; — GB3's GF, Guildford; HN, Hitchin; HO, Horsham; HW, Romford; LC, Louth; MW, Leamington Spa; ND, Ilfracombe; SH, Honiton; TH, Tamworth; WN, Wolverhampton and Z1, Stafford. Operational dates will be published if and when advised. The Anglo-Scottish repeater at Caldbeck in Cumbria was due to commence relaying on VHF channel R1 on Feb. 16. For details contact G4HMA (*QTHR*). During a blizzard on Jan. 21, the aerial and mast of the Ulster repeater GB3WT in West Tyrone were blown down. A temporary vertical dipole has been installed but coverage is restricted. A new mast and aerial is promised for March sometime.

The suggestion that repeaters be switched off during major VHF lifts is supported by David Brooks, G4IAR, from Leicestershire. However, he asks, "Who decides that it is a major lift?" Perhaps members of the numerous repeater groups should discuss this at meetings and in the columns of their newsletters so that a sensible solution to the problem of co-channel chaos during lifts can be agreed.

Six Metres

Declining *m.u.f.*'s have curtailed the hectic cross-band 6/10m. activity of recent months. John Baker, GW8MHW (Dyfed) reports the 6m. band as "normal" up to Jan. 9, but on the 10th and 11th only a very weak signal from VE1AVX was heard. John made 413 cross-band

contacts in all U.S. call areas plus VE, VO, KP4 and KV4 including 37 U.S. states. He reports that EI6AS and TF3SG have 6m. licences.

Jean-Louis Delpont from Brussels sent in an *s.w.l.* report up to Dec. 17 listing stations in all U.S. areas except 6 and 7, plus VE1, VE2, VO, VP2 and KP4. Brian Bower, G3COJ (Bucks.) advises that the Cyprus stations have permission to operate on 50.11 and 50.5 MHz. 5B4AZ has crystals on order and will listen on 28.885 MHz for cross-band replies. It seems that SSB operation is unlikely, only CW and AM!

Four Metres

The CW Contest on Jan. 20 gave 4m. addicts the chance to work a few counties for the 1980 Three Band Table. Frank Howe, G3FIJ (Essex) managed 12 including G3XBY (Warks.) and G3UKV (Salop.). Ray Elliott's, G4ERX, (Essex) best DX was GM4IGS in Strathclyde in "fair conditions". Dave Thorpe, G4FKI (Essex) also managed G3UKV. Arthur Breese, GD2HDZ, did not mention the contest and has so far only worked G4FXW (S. Yorks.); G3FDW (Notts.) and G3BA (W. Midlands).

GW3MHW and G2AOK (Glos.) continue their nightly skeds and usually get through in spite of the dreadful path between them. John says that GW4BCD in Porthcawl (Mid. Glam.) hopes to get his 4m. beam back up again soon. Several 4m. operators have expressed grave misgivings that the WARC decision to abolish the Morse test for amateur licences above 30 MHz. instead of 144 MHz. as at present, might unleash hordes of G8's on the band with demands for FM, repeaters and "channelisation". However, the WARC decisions are not effective until Jan. 1 1982 so it will be two years before any change could be legally made. It should be remembered that this unique amateur band allocation is a parochial British one with no international implications. It could be that the Home Office continues to let us use it simply *because* activity is low. Indeed, rather than risk the widespread abuse in the repeater part of the 2m. band happening on 4m., the privileges could be withdrawn altogether. Your views on this topic would be welcomed, both from Class "A" and Class "B" operators.

QTH LOCATOR SQUARES TABLE

Station	23 cm.	70 cm.	2 m.	Total
G3POI	—	—	282	282
I4EAT	—	25	238	263
DK3UZ	—	—	210	210
G3IMV	—	—	206	206
G3CHN	—	—	183	183
G3SEK	—	—	179	179
9H1CD	—	13	178	191
G9H1BT	—	11	163	174
G3FPK	—	—	158	158
GM4COK	—	12	154	166
G4ERG	—	—	154	154
GJ4CD	—	52	149	201
G4CMV	—	35	140	175
EA3LL	—	15	137	152
G3VYF	—	40	136	176
GM4CXP	—	25	136	161
G8HVY	12	73	130	215
G4IJE	—	—	124	124
G8GML	11	74	122	207
GJ8KNV	—	46	118	164
G4BWG	—	29	118	147
G4IGO	—	—	118	118
G4IJW	1	30	108	139
G3BW	3	25	108	136
G4AWU	—	1	105	106
G3OHC	4	33	104	141
G8IXG	—	—	104	104
G8HHI	—	36	102	138
G8LEF	22	62	101	185
G8LHT	7	39	98	144
G4FBK	—	5	98	103
G3JXN	35	73	94	202
G3COJ	24	66	93	183
G2AXI	2	54	93	149
G8ATK	3	41	93	137
G3KPU	—	25	91	116
G4DEZ	—	—	90	90
G8KGF	—	17	89	106
G6UW	—	—	88	88
G8LGL	—	15	87	102
GM8NCM	—	12	84	96
G8KPL	—	7	84	91
G8JJR	—	3	84	87
G4HYD	—	40	83	123
G8LFJ	—	—	81	81
G8OPR	—	25	80	105
G8JAG	—	7	78	85
G8KSP	—	2	76	78
GD2HDZ	12	37	74	123
G8MFJ	—	15	74	89
G4GET	—	—	72	72
G3SPJ	10	36	71	117
G4ERX	1	38	69	108
G8IFT	14	27	68	109
G3FIJ	—	27	68	95
GJ3RAX	1	24	67	92
G4GHA	—	—	67	67
G1BWM	—	22	64	86
G8KAX	—	36	62	98
G4AEZ	5	29	61	95
G4GEE	—	28	60	88
G3PBV	—	25	58	83
G8GXE	—	32	56	88
G8ITS	—	16	56	72
G4GXT	—	1	56	57
G4GSA	—	1	50	51
G8JGK	—	—	50	50
G8PRG	—	12	39	51

Starting Date January 1, 1975. No satellite or repeater QSO's. "Band of the Month" 2m.

Two Metres

The conclusion from all your letters and comments over the air is that January was a very interesting month. It provided several *Auroral* events, a very good meteor shower, some

excellent tropo. and, of course, an unusual winter *Sporadic E* opening on the 5th.

Concerning the *E's* affair, there have been no reports of any British station working anyone. However, Paul Gobey, G8IYG (Stafford) told your scribe that, at 1200 he heard YU2CMS calling "CQ DX" on 144.2 MHz for about a minute. The *Quadrantids* were over by then and anyway SSB MS operators would call either plain "CQ" or "CQ MS". Paul copied this station for about a minute. The QRB would be about 1,400 kms. and it suggests a reflecting area in DJ square. F1CXW (DI) worked RA3YCR (RN52f) at 1035 and this was monitored by ON7EH who worked the Russian half an hour earlier. Other F's worked into RN, RO, RP and RQ locators. Considerable *E's* propagation in the Jan. 2-4 period in the 60 to 80 MHz region has been reported.

Eddi Ramm, DK3UZ (EN20c) had three completed MS QSO's in the *Geminids* last December; YU3ABL (GF); UK5JAO (QE) at 1,981 kms; UA3OG (UR) at 1,960 kms. He is now up to 210 squares worked. From Reus, Spain, José M^a Gené Llagostera, EA3LL (AB66j) mentions the fine tropo. conditions of Nov. 27-29 when he worked into I1, I4, I5, I8 and I0. Best DX were I4MJQ and I4PVU in GE73c, on the Adriatic coast. On MS, during the *Geminids*, he mentions a QSO with G4IJE. The *Quadrantids* provided contacts with OZ1OF (EQ); OK1OA (HK); G4IGO (YL); Y23PA (GO) and with F, DL and PA stations.

Mike Allmark (Leeds) thought the *Quadrantids* the best in three years, the shower appearing to peak at 2300 GMT on the 3rd. Best DX heard was IT9FEJ. Mike mentions some "weird call signs," quoting IV3HWT and Y24TN. Well, IV3 is the prefix for the provinces of Friuli, Giulia and Venezia in northeast Italy and Y2 is the new East German prefix replacing DM. He lists some nice DX copied on the random SSB QRG of 144.2 MHz, including 7 YU's; HG1YA (IH); I5WBE (FD); IW5AVM (FC) and EA3ADW (BB). The only station heard in the Jan. 13 *Ar* was GM8NGG (inverness). This event occurred during a tropo. lift when Mike copied DL, OZ's and SM in EO, EP, EQ and FP squares.

G3COJ heard only GM's in the Jan. 13 *Ar* from 1839 to 1859 when he

had to switch off. During the *Ar* of the 27th, between 1812 and 2030, Brian worked GM3JIJ, GM4DJS, GM4ILS and heard SM0DJW. The *Ar* on the 28th. was in progress at 1842 and GM3UDJ, GM3ZXE (YQ), and OZ1CTZ (EQ) were worked, fade-out being at about 1930. Brian mentions some Spanish FM signals being briefly audible on 144.1 MHz during the Jan. 28 *Ar*, via tropo. At 2300, EA1CV was worked.

Dave Sellars, G3PBV (Devon) was on for the tropo. lift of Jan. 13 which produced many strong PA's but only a few weak DL's. During the tropo. event on the 28th, Dave managed QSO's with F6FLW (YH) and EA1CV (XD), but he had little luck with the Jan. 27 *Ar*. David Butler, G4ASR (Hereford) is now keen on MS and, during the *Quadrants*, worked into DL, HG, I, LA and SM and heard OY5NS. He reckons his station is "nothing special," just 150 watts to a 6-elel. *Quad*.

Ken Osborne, G4IGO (Avon) is now up to 27 countries worked and is another keen MS type. On Jan. 3 he completed with DL7QY (FJ) in 75 mins. and with Y22ME, ex-DM2BYE (HM) in 45 mins. including an 8 secs. burst. OH0JN (JU) was worked in 50 mins. and included a 10 secs. burst. On the 4th, the QSO with EA3LL (AB) was over in 35 mins on SSB and contained a 20 secs. burst. Paul Turner, G4IJE (Essex) completed *Quadrants* contacts with I1DMP (DF), YU3AJK (HG) and DL1MF (GH), from skeds. On random CW, SM5AQJ (JT) and YU7AOP (KF) were successfully worked.

John Perkins, ex-G8MLY, is now G4IVV from Norwich and is yet another MS convert running 80 watts to a 16-ele. beam at 50 ft. He worked YU1EU on random MS in the *Quads*., but failed to complete with OZ5IQ and SM2CKR. Russell Stewart, G8BHH (Staffs.) is probably best known for consistently good contest performance as GW8BHH/P. He has probably achieved one of the best station set-ups at the present state-of-the-art. The transceiver is a Yaesu TS-700 with a 3SK88 pre-amp. The final amplifier uses a pair of Eimac 8874's and the aerial is a 14-ele. *Parabeam* fed with Ca212 cable. During the Jan. 13/14 tropo. opening, Russ worked OZ1DPR (EP) and Dutch stations in CL and DN squares.

Tony Collett, G8GXE (Berks.) has

THREE BAND ANNUAL VHF TABLE
January to December 1980

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		TOTAL Points
	Counties	Countries	Counties	Countries	Counties	Countries	
G8OPR	—	—	56	14	27	5	102
GJ4ICD	—	—	40	10	31	7	88
G8GXE	—	—	43	10	26	6	85
G3FPK	—	—	50	12	—	—	62
G3PBV	—	—	27	7	21	5	60
G4DEZ	—	—	41	15	—	—	56
G8IFT	—	—	19	4	19	6	48
G8HHI	—	—	4	5	21	8	38
G4ERX	12	2	—	—	16	5	35
G3FIJ	12	1	9	4	5	2	33
G8RZA	—	—	20	8	—	—	28
GD2HDZ	3	1	6	2	13	1	26
GM4CXP	—	—	16	7	—	—	23
G4FKI	9	1	5	1	3	1	20
GM4COK	—	—	4	9	—	—	13

got off to a good start in the table and mentions EI9Q (WM) worked on Jan. 1, G8CVF (Merseyside) on the 10th, and G3BW (Cumbria) on the 11th; all counties not worked in 1979. He worked OZ1BRJ (EQ) on the 14th. and mentions the intriguing lift of the 27-29th which seemed only to produce incredibly strong signals from GU and GJ. John Pilags, G8HHI (Hants.) writes in again after a long period off the air due to house-building work. The FT-221R and '6-40A amplifier are perking again with an F9FT 16-ele. beam up at 40 ft. He notes the tremendous signals from the Channel Islands in the Jan. 28/29 period.

Congratulations to Dave Cox, G8OPR (Hants.) who leads the annual table this first month. He, too, had his first ever go at MS in the *Quads*. and completed with LA3WU (CU) in just 45 mins. which included a 30 secs. burst. The contact with Y24TN took only 12 mins. including the exchanging of "73's," and the QSO with OE5KE, 26 mins. Welcome to new contributor Andy Markham, G8RZA (Essex) who uses an Icom IC-202 and 25 watts amplifier to a home made 5-ele. ZL-Special at 24 ft. He managed some good G-DX in the Jan. 27-29 lift including five GJ/GU folk. His best DX was DK8SG (EI) on the 29th.

GD2HDZ heard GJ8TDT on the 29th but was unable to penetrate the pile-up. As usual, Arthur missed the *Ar* of Jan. 27! Darrell Mawhinney, G8JPG (Co. Antrim) started off in the *Quads*. with a faulty linear but got it going in time for successful QSO's with SM5CUI (IT), PA2VST (CM) and OK10A (HK), country no. 20 on the band. On 144.2 MHz. S9-plus bursts were received from I4BXN, DF3RU, DF3XU, DB2NN and YU2RGK. The busiest station in the

Jan. 27-29 period must have been Geoff Brown, GJ4ICD who worked, on 2m. and 70 cm. 319 G's, 242 PA's, 106 DL's, as well as F, GW, ON, OZ, etc. These conditions gave him a good start to the 1980 season.

North of the border, George Szymanski, GM4COK (Edinburgh) detected the Jan. 1 *Ar* at about 1730 and found QTF's between 35 and 50 degrees. 18 stations in 7 countries were worked; mostly on CW, viz: — DL, EI, GM, LA, OZ, PA and SM. LA8AK (DS80b) was a new 2m. square. George had some success in the *Quads*., the sked with IV3HWT on SSB in GF square was completed in about one hour. Nothing was heard from UA3LAW (PO) and UO5OGF (OG) on CW. On random SSB, George had QSO's with DF3RU (FJ), I4BXN (FE) and DF6NA (EJ). He will not be active again till the end of March.

Derrick Dance, GM4CXP (Borders) has hotted up his FT-221R with a *muTek* board as mentioned in last month's piece. He has also acquired a *Katsumi* memory keyer and modified it to send 500 l.p.m. and continuously re-cycle, with future MS work in mind. In the Jan. 1 *Ar* he worked into LA, OZ and SM including SK7EY (HQ73j) a new square and LA7KK in FU. QTF's were between 45 and 60 degrees. The first QSO was at 1710 and fade-out about 1910. On Jan. 13, Derrick was listening to some French broadcasting stations on Band 2 FM and found GB3VHF peaking S3. GB3CTC appeared, "out of the noise," at S2.

Sheldon Hands, GW8ELR (Dyfed) is a consistent signal into the London area from Milford Haven (XL26g) and his new 20-ele. colinear array is obviously performing well. He worked your scribe and others in flat

conditions during the short, unpublished Grafton Club Contest on Feb. 10.

At G3FPK, the Jan. 13 *Ar* started around 1805 and GM4IAO (YR47h) was the only station worked near the end. Fade-out was pretty abrupt at 1859 as SM4IVE was being called. Earlier in the day, G18TBQ (Co. Down) was contacted. He is Tim Crawford and a young, sightless operator, using an FT-225R and 100 watts amplifier to a crossed 10-ele. Yagi array at 46 ft. Northumberland and Cleveland are "difficult" counties from the south of England. However, G8TQL (ZP63h) and G4ABM (ZO) were worked respectively on the 16th and 28th. The *Ar* of Jan. 27 was discovered at 1830 and went on till about 2030 producing SM4IVE (HT68d) and LA3WU (CU47d) towards the end. Only GM4BYF (YP04d) was worked in the *Ar* the next day, this event fizzling out at 1935.

Tim Hague, G8GGP (Kent) mentions an *Ar* event on Feb. 6 between 1910 and 1940 during which he worked GM3JII (WS) at 1938 and heard a weak SM on CW.

Seventy Centimetres

G3PBV is pleased to find increasing activity on this band. During the lift of Jan. 13, Dave worked 3 PA's in CM square and he found signals stronger than on 2m. Since then a 50 watts amplifier has been added to the system, in time for the opening at the end of the month. On the 28th, GW3NYY (XL) F1FHI (ZH), F1BQL (XI), F1EFD (YI) were worked and Dave thinks French activity is on the increase now. During the Feb. 3 contest, conditions were poor with lots of QSB and scatter which seemed to make beam headings vague. 16 QSO's were made including G8LGL/A in Merseyside operating from G3WOH's QTH.

Mike Lee, G3VYF, (Essex) now has his 4CX250B amplifier going on the band and it has helped to push his squares tally up to 40. In the Jan. 28/29 period, he added DJ3OS (EJ), F6AID (ZJ), DB2VY (DJ) and F1FHL (ZH) and a few more U.K. squares in the contest. G4ERX's best DX in the contest was GD2HDZ in rather poor conditions.

G8BHH's station on 70 cm. consists of a home-brewed 70 MHz multi-mode affair, *Microwave Modules*

transverter plus NE 64535 pre-amp. and a *K2R/W* linear. The aerial is a 22-ele. loop fed with Ca212 cable at 17 m. During the opening of Jan. 13/14, Russ worked many PA and DL stations including FN square. Signals on the morning of the 14th were ducting in to Wolverhampton at 50 dB. over the noise. On the 28th, PA, DL and ON folk were worked in BL, CL, CM and DL squares.

G8GGP was only on for the last hour of the contest and thought the conditions poor. In the end-of-Jan. lift, Tim worked into EJ, EK and EL squares. G8GXE spent most of the month on 70 cm. and now has 50 watts feeding a 48-ele. *Multibeam*. Tony made 23 QSO's in the last session of the *Cumulatives* on Jan. 8, in 15 counties including GW8HZK/P in Powys. The Jan. 13/14 session produced PA0DBQ (CM), DK7LJ (FO) and DF5LQ (EO) and a few weak OZ's and SM's were heard. He lifted all the GU's and GJ's in the lift of 28/29, rounding off with G3AAV (Leeds) when the band was closing.

G8HHI uses a *Belcom* Liner-2 and 10 watts transverter with a 21-ele. *F9FT* beam at 47 ft. John took full advantage of the last lift by working the GJ's and GU's plus ON, DL and PA stations in BL, CL and DL squares. He describes contest conditions as "flattish," best DX being G8LGL/A. Ian Gordon, G8IFT, (Birmingham) uses an *Icom* IC-402 transceiver driving a 35 watts, 2C39A amp. plus a *BFR34A* pre-amp. on receive. The aerial is an 18-ele. *Parabeam*. On Jan. 13, OZ71S (GP22j) at 1,002 kms., and OZ9FW (GP31b) at 992 kms. were contacted, along with some PA's and DL's.

Paul Broadhurst, operated from G3WOH's QTH in the contest, 15 kms. east of Liverpool, and made 69 QSO's worth 415 pts. in not very good conditions. He says that G8NDT/A and G3NNG did well. G8OPR now has 100 watts on the band feeding an 18-ele. *Parabeam* which latter he hopes to replace with a couple of 21-ele. *F9FT*'s in the summer. GJ4ICD was worked at S9-plus on the 29th. but only S1-2 reports were exchanged in the later contest. GJ4ICD ran up a fat electricity bill for sure at the end of January, working 7 countries and 25 counties, up to Gtr. Manchester and Lancs. 4 more squares came out of it; CK, CN, DJ and EJ.

Twenty-three Centimetres

On 23 cm. G8BHH uses his *TS-700* as the prime mover into a pair of 3CX100A5's operating as a power mixer and PA. "Up top" at 15m. are a pair of 25-ele. *Quad loops* and masthead pre-amp. using an MRF902, the low-loss feeder being FSJ450. Russ made some good QSO's on the 13/14th. Jan. including DK3OL and DL0SO/A in DL square, DF7VX (EL), DF3XU (FN) and DB4LT (EO).

G8IFT's Tx runs 15 watts of FM at present and an SSB rig is being built. The Rx has a BFR90 pre-amp. to a *Microwave Modules* 1296/28 MHz converter, the aerial being a *Q-L-Y*. On Jan. 13, Ian worked nine PA's and DL0SO/A, DF3XU, DB4LT, DK7LJ (FO), DF9LN (FO) and DK3UC (FN14a) who is ex-DC1XC in Lübeck at 863 kms. and the best DX. Ian sums it up thus; "All rather good. 6 new squares; pile-ups and QRM from 800 kms. away."

Final Miscellany

This year, Belgian stations can use the prefixed OR and OT as well as the familiar ON. *Via* GJ4ICD, it was learned that the Lannion beacon, FX3THF, erstwhile on 144.905 MHz, will not be re-licensed. The Emley Moor beacon, GB3EM, on 432.91 MHz, which was off for a few weeks, came back on, on Feb. 10. The Durham beacon, GB3NEE, on 144.130 MHz. was heard weakly from Jan. 29 in London. For DX-hunters on 2m., each evening from 2130 on 144.24 or 144.26 MHz, there is a net of GM's in the islands including 3JII, 3SWK, 4HDL, 4JAP, 5FM, 8PEV and 8SAU. On Sunday from 1630, a group of EI and GW operators have a net on SSB on 144.225 MHz and EI2ACB has been worked from London. She is Karen, one of the new, Irish VHF-only licensees distinguishable by the three-letter suffix ending in a "B."

Deadlines

1980 got off to a good start so let us hope you have lots to report for the April issue, the copy deadline for which is March 5. Everything to: "VHF Bands," *SHORT WAVE MAGAZINE*, 34 High Street, WELWYN, Herts., AL6 9EQ. 73 de G3FPK.



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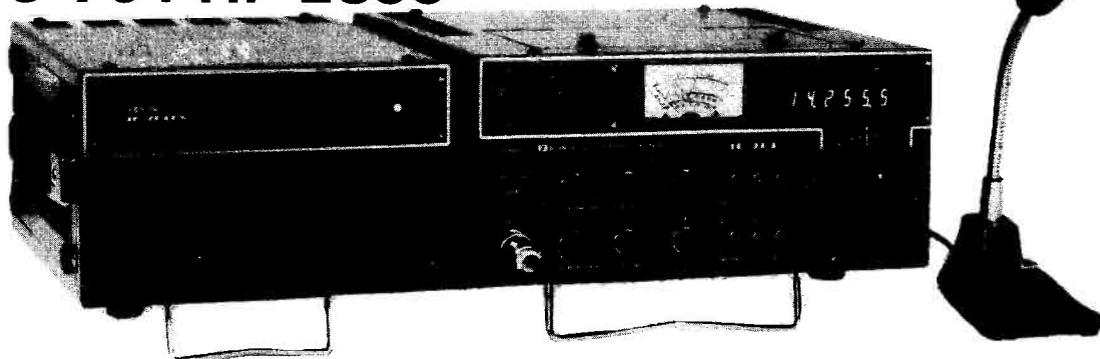
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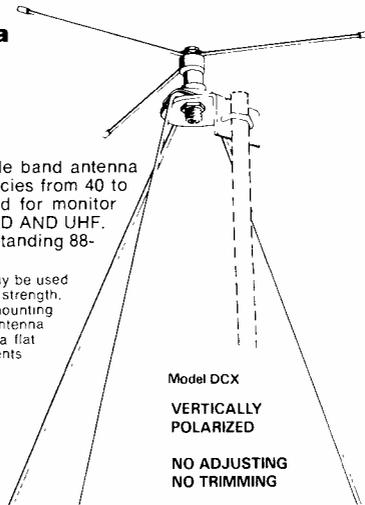
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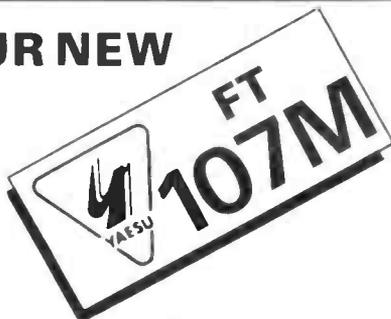
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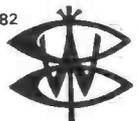
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ALL SOLID STATE FT-107M→



FT-107M. This is the brand-new solid-state HF Transceiver which has just been included in the ever-growing range. The receiver performance is comparable to the FT-901 (which says everything) and a memory option is provided of 12 programmable channels plus fine tuning. Add to this the ease of tuning, 240 PEP input, superb low-profile styling and here is the rig for the Eighties.

HOW TO REACH US (EASY PRIVATE PARKING ON OUR 90ft FORECOURT)

FROM SOUTH AND EAST. We are located approximately two miles from Junction 5 of the M6 from which follow signposts to Birmingham. Within ¼ mile turn right at Clock Garage and proceed towards city. After one mile look for traffic lights at Fox & Goose and immediately over the lights take minor left fork into Alum Rock Road. We are located one mile from this point.

FROM NORTH. Leave M6 at Junction 6 (Spaghetti) and follow left fork down to traffic island beneath motorway complex. Take third turning off to Lichfield. One mile further on follow A4040 to the right and within 100 yds veer again to the right, approximately one mile further on brings you to the Fox & Goose. Turn right and see preceding directions.

FROM THE WEST AND SOUTH/WEST. Follow M5 then M6 to Spaghetti Junction (see above). Alternatively, leave M5 at junction 4 or 3 and proceed to inner ring road. Turn South on ring road and leave on A47 (East). We are located three miles from this point.

Hours: 9.30—5.30 Continuous including Saturdays—Early closing Wednesday, 1 p.m.



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source for YAESU MUSEN



YAESU FT-101ZD

FT-101ZD. When YAESU first introduced the original FT-101 this was the trend setter of the day and so it has been with each succeeding version of this world famous transceiver. Countless thousands have been purchased around the Globe and the reputation which these rugged rigs earned for performance and reliability operating under every form of adverse condition went a long way towards establishing the YAESU MUSEN name. When the latest model, the FT-101ZD, was launched last year we knew as soon as we saw the first delivery that once again YAESU had a winner and the sales that have followed have proved this beyond any shadow of doubt. There is simply nothing on the market that can match the FT-101Z and FT-101ZD for value for money and—as we keep saying—the performance outstrips many a rig with a fancier price tag.



THE ABOVE IS ONLY PART OF THE YAESU STORY – FOR FULL DETAILS OF ALL THE MODELS 36p IN STAMPS WILL BRING YOU THE LATEST GLOSSY CATALOGUE OF THE FULL PRODUCT RANGE TOGETHER WITH OUR CREDIT VOUCHER FOR £3.60 – A 10-1 WINNING OFFER!



AND WHAT ELSE IS AT AMATEUR ELECTRONICS?

The short answer is 'PLENTY' but the full reply is a very lengthy one indeed these days. Quite apart from the host of accessories and ancillary units stocked we import the superb SWAN range as per our recent advertisements and carry ATLAS equipment and latterly the full ICOM range. Add to these the superb new STANDARD RADIO models and you'll soon see that a visit could be well worth while. If you can't make it of course then we shall be pleased to send you all the information you require by return post. Lest you forget!—we carry the full Jaybeam range plus a good choice of mobile aerials.

ATTENTION BARGAIN HUNTERS! A large SAE will bring you our latest used equipment list and our special offers on discontinued new gear and new demonstration models.

AGENCY APPOINTMENTS

We are pleased to announce that we have extended our service to out-of-town customers with the appointment of two new agents in areas which are, in our view, lacking in amateur sales facilities at the moment. As from the appearance of this issue AMATEUR ELECTRONICS UK will be fully represented by the following AGENTS and the personnel involved, named or otherwise, are fully licensed operators who have been selected for their interest in and knowledge of, the hobby not to mention their impeccable bona fides.

EAST ANGLIA – Dr T. THIRST (Tim) G4CTT, NORWICH. 06925 403

NORTH EAST – NORTH EAST AMATEUR RADIO, DARLINGTON. 0325 55969

We hope customers in the above areas will avail themselves of the service now offered and we are sure they will derive great benefit from expert local help.

Our existing representatives remain, of course, as below.

- BRANCH: AMATEUR ELECTRONICS, UK – COASTAL, CLIFTONVILLE,
KENT, KEN McINNIS, G3FTE, THANET (0843) 291297. 9 a.m.-10.30 p.m.
- BRANCH: AMATEUR ELECTRONICS UK – SCOTLAND, 287 MAIN STREET,
WISHAW, LANARKSHIRE, GORDON McCALLUM, GM3UCI.
TELEPHONE WISHAW 71382. (EVENINGS CARLUKE 70914)
- AGENT: WALES & WEST – ROSS CLARE, GW3NWS, CAERLEON, NEWPORT.
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MN-2700	ATU/RF Wattmeter 160-10m, 2kw	197.80
WH-7	RF Wattmeter/VSWR bridge HF	59.80
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144.4 (433.2)	b													
144.480	b													
144.800	c													
144.850	c													
145.000/R0T	c	b	b	b	b	b	b	b	b	b	b	b	b	b
145.025/R1T	c	b	b	b	b	b	b	b	b	b	b	b	b	b
145.050/R2T	c	b	b	b	b	b	b	b	b	b	b	b	b	b
145.075/R3T	c	b	b	b	b	b	b	b	b	b	b	b	b	b
145.100/R4T	c	b	b	b	b	b	b	b	b	b	b	b	b	b
145.125/R5T	c	b	b	b	b	b	b	b	b	b	b	b	b	b
145.150/R6T	c	b	b	b	b	b	b	b	b	b	b	b	b	b
145.175/R7T	c	b	b	b	b	b	b	b	b	b	b	b	b	b
145.200/R8T	c	b	b	b	b	b	b	b	b	b	b	b	b	b
145.300/S12	c	b	b	b	b	b	b	b	b	b	b	b	b	b
145.350/S14	c	b	b	b	b	b	b	b	b	b	b	b	b	b
145.400/S16	c	b	b	b	b	b	b	b	b	b	b	b	b	b
145.425/S17	c	b	b	b	b	b	b	b	b	b	b	b	b	b
145.450/S18	c	b	b	b	b	b	b	b	b	b	b	b	b	b
145.475/S19	c	b	b	b	b	b	b	b	b	b	b	b	b	b
145.500/S20	c	b	b	b	b	b	b	b	b	b	b	b	b	b
145.525/S21	c	b	b	b	b	b	b	b	b	b	b	b	b	b
145.550/S22	c	b	b	b	b	b	b	b	b	b	b	b	b	b
145.575/S23	c	b	b	b	b	b	b	b	b	b	b	b	b	b
145.600/R0R	c	b	b	b	b	b	b	b	b	b	b	b	b	b
145.625/R1R	c	b	b	b	b	b	b	b	b	b	b	b	b	b
145.650/R2R	c	b	b	b	b	b	b	b	b	b	b	b	b	b
145.675/R3R	c	b	b	b	b	b	b	b	b	b	b	b	b	b
145.700/R4R	c	b	b	b	b	b	b	b	b	b	b	b	b	b
145.725/R5R	c	b	b	b	b	b	b	b	b	b	b	b	b	b
145.750/R6R	c	b	b	b	b	b	b	b	b	b	b	b	b	b
145.775/R7R	c	b	b	b	b	b	b	b	b	b	b	b	b	b
145.800/R8R	c	b	b	b	b	b	b	b	b	b	b	b	b	b
145.950/S38	c	b	b	b	b	b	b	b	b	b	b	b	b	b

PRICES: (a) £1.95; (b) £2.32; (c) £2.80; (e) £3.94.

AVAILABILITY: (a), (b), (c) stock items, normally available by return (we have over 5000 items in stock). (e) 4/6 weeks normally but it is quite possible we could be able to supply from stock.

N.B. Frequencies as listed above but in alternative holders and/or non stock loads are available as per code (e).

ORDERING. When ordering please quote (1) Channel; (2) Crystal frequency; (3) Holder; (4) Circuit conditions (load in pf). If you cannot give these, please give make and model of equipment and channel or output frequency required and we will advise if we have details.

JAPANESE AND AMERICAN EQUIPMENT We can supply crystals for YAESU (FT2F, FT2 Auto, FT224), most of the ICOM range and the TRIO-KENWOOD range. We can also supply from stock crystals for the HEATHKIT HW202 and HW17A.

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Adj tol \pm 20 ppm, Temp. tol \pm 30 ppm — 10 to +60°C
 ϕ 800 to 999.9 kHz (fund) ... £9.50 *25 to 30 MHz (fund) ... £7.56
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 * ϕ 3.4 to 3.999 MHz (fund) ... £5.43 *105 to 125 MHz (5 O/T) ... £7.09
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Delivery * Normally 4/6 weeks (express available), all other frequencies 6/8 weeks. Holders: Low frequencies HC13/U or HC6/U dependent on frequency. High frequencies are available in HC6/U, HC18/U or HC25/U unless marked ϕ only available in HC6/U or ϕ only available in HC18/U and HC25/U, HC17/U (replacement for FT243) and HC33/U (wire end HC6/U) available as per HC6/U above at 25p extra on HC6/U price. Unless otherwise specified, fundamentals will be supplied to 30pf circuit conditions and overtones to series resonance.

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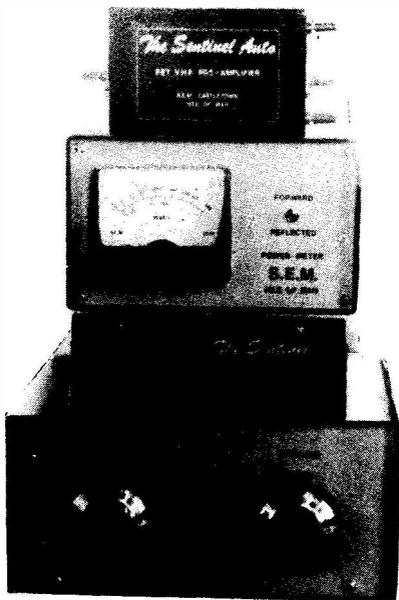
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The 2 metre units use a neutralised J. FET circuit rather than the more common MOSFET or grounded gate J FET. This gives lower noise figures and higher gain. We select the J FETs for a 1dB noise figure and 18dB gain.

The noise figure of 2 metre receivers is usually 7-8dB and to overcome this noise we find the 18dB is necessary. We use 18 s.w.g. (1.22 mm) air spaced coils for high Q. These are both efficient and selective.

We have three models for your choice.

1. SENTINEL AUTO 2 METRE PRE-AMPLIFIER

For connection straight into the aerial lead and the r.f. switch changes over automatically between transmit and receive on any mode. See above for more detail. 12V nominal. Size: 1½" x 2½" x 4". Price: **£20.00* ex. stock.** 70 cm version **£23.00* ex stock.**

2. PA5 AUTOMATIC 2 METRE PRE-AMPLIFIER

Same as the Sentinel Auto but for 240V mains operations in a pretty little case. Size: 3¼" x 6¼" front panel, 2¼" deep. SO239 sockets. Price: **£28.75 ex. stock.**

3. SENTINEL STANDARD 2 METRE PRE-AMPLIFIER

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Mini 2 metre pre-amp. Size 1 cubic inch to fit inside transceivers. N.F. 2dB gain 18dB. 9-15V. **£8.00 ex stock.** 70 cm version **£10.00 ex. stock.**

S.E.M. Z MATCH

This circuit is generally accepted as being the most VERSATILE transmatch system.

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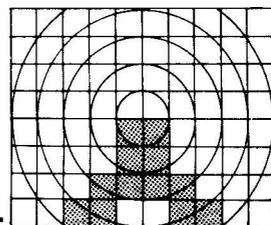
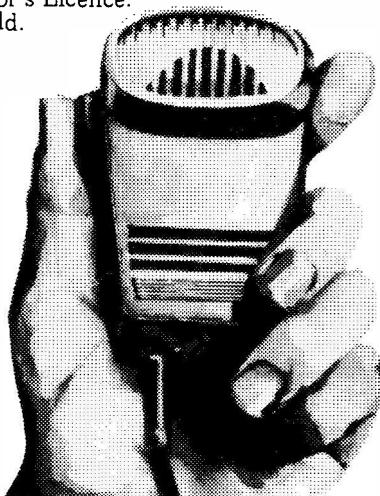
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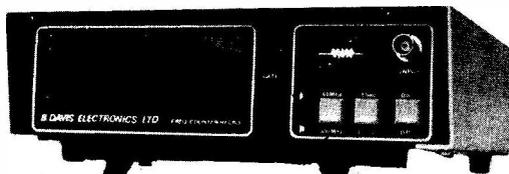
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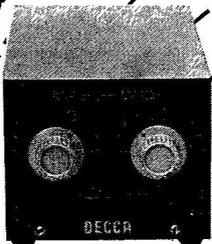
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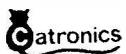
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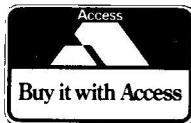
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